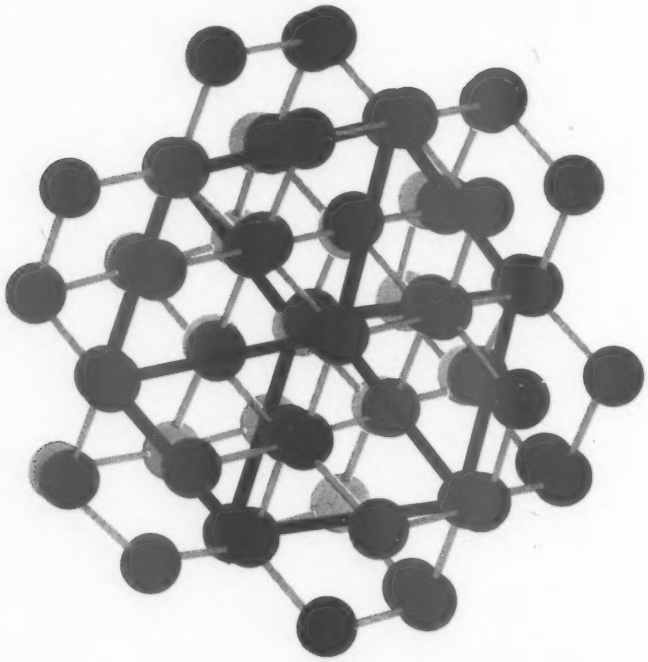
AUGUST, 1961

ARMED FORCES Management

PUBLISHED FOR THE MILITARY SERVICES OF THE FREE WORLD

Defense Comptroller Hitch . . . 34

Making Sense Out of DOD's Budget Process 18
Gen. Bradley Prunes AF's Money Tree 39
Special Report: How to Clobber Communications . . . 14



MOLECULAR ELECTRONICS PROGRESS AT WESTINGHOUSE: COMPLEX SYSTEMS MADE WITH MULTI-FUNCTION "BLOCKS"

Multiple electronic circuit functions in microscopic solids—and successful combinations of these tiny structures into systems—have actually been accomplished in the Westinghouse molecular electronics program.

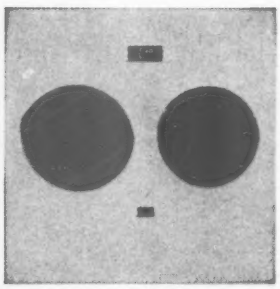
Examples include an operating UHF communications receiver, a 3-bit binary computer unit, and a digital guidance receptor. Although still in early development, these examples are working demonstrations of molecular electronic systems. They indicate exciting things to come in this revolutionary new field.

Primary goal of space-saving molecular electronics is systems reliability . . . functional electronic blocks have fewer components and connections . . . less power is needed, less heat generated . . . redundancy is simple to achieve.

Working under an Air Force contract, Westinghouse scientists have invented tiny molecular blocks to do many sophisticated electronic jobs. They have made new semiconductor materials, grown crystals in ribbons and layers, and developed the industry's most advanced techniques for fabricating circuits in molecular blocks.

Pioneering in this important field is another of the many ways science serves defense at Westinghouse. Defense Products Group, 1000 Connecticut Ave., N.W., Washington 6, D. C.

Westinghouse



Three of many functional blocks: top center, a transistor "and" gate replaces 6 conventional components. Lower center, a 10 MC video amplifier for telemetering. Planar device at left contains 20 resistors, 8 transistors, 40 diodes—all diffused.

Here is a laboratory model of a three-bit binary computer circuit with 26 encapsulated molecular gates working together as a unit. Tiny "and" gate (held) contains 4 diodes, 1 resistor and 1 transistor.

Hybrid molecular electronic UHF receiver, being developed for the Air Force, was designed with specifications of the AN/ARC-63 as a guide. Circuits operating below 30 MC are constructed with molecular electronic blocks.

Westinghouse work in molecular electronics for the Air Force is under the jurisdiction of the Aeronautical Systems Division's Electronic Technology Laboratory.

He's solving a real estate problem

This AMF engineer's job is determining how best to move big missiles off shore for launching. Should they be floated out horizontally, flooded to an upright position, and then launched? Or, would it be more feasible to barge them out? Might they be moved to or assembled on "Texas Towers," or would a causeway or simply land-fill be the answer?

Behind the project is our shrinking real estate at launching sites, plus the hazards inherent in launching Saturn-sized missiles (and the coming, nuclear-powered missiles) near other installations. Off-shore launching may be the answer.

Feasibility studies of all types are an AMF specialty. What kind of remotely controlled machinery is required to service nuclear-powered aircraft? What kind of habitation could be built on (or under) the surface of the moon? What sort of machines (manned and unmanned) could survey the moon's surface without, for example, falling into a fissure? What is the best way to assemble a space station? All these are problems AMF engineers are presently investigating.

If your problem is the first of its kind, AMF will not, of course, have met it before. But AMF's long experience in accepting totally unique challenges gives it an advantage enjoyed by few other organizations concerned with ground support, launchability and space environment. To get further information write American Machine & Foundry Company, 261 Madison Avenue, New York 16, N. Y.

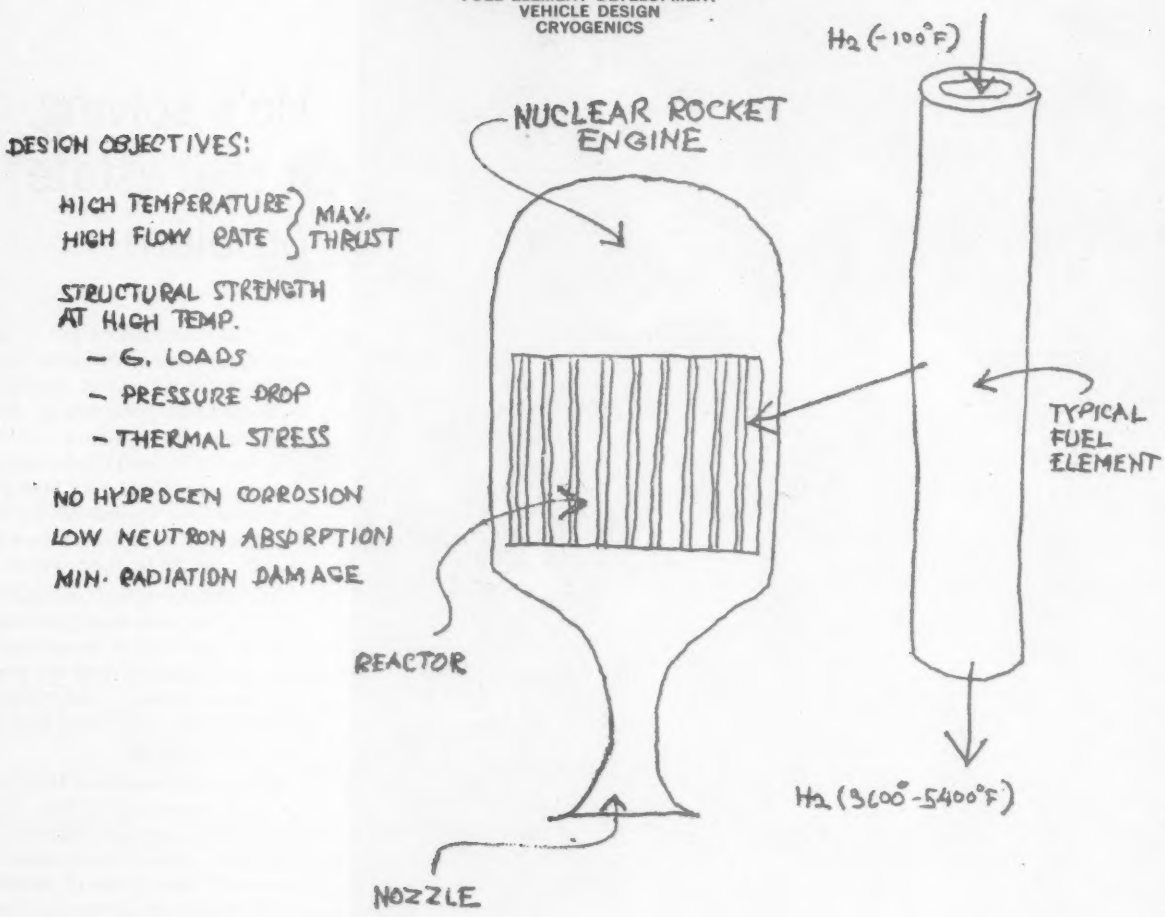
AMF

In engineering and manufacturing AMF has ingenuity you can use...

AMERICAN MACHINE & FOUNDRY COMPANY

MARTIN NUCLEAR ROCKET PROGRAM

REACTOR DESIGN
PROPULSION REACTOR START-UP
NUCLEAR ROCKET SAFETY ANALYSIS
RADIATION EFFECTS ON ROCKET SYSTEM
FUEL ELEMENT DEVELOPMENT
VEHICLE DESIGN
CRYOGENICS



THE PROBLEM OF FUEL ELEMENT DEVELOPMENT FOR NUCLEAR ROCKETS

Nuclear propulsion offers advantages for extended space exploration simply because nuclear energy provides more power per pound than any other power source known. Because fuel element temperatures for rocket reactors may range as high as 5400°F (higher than the boiling point of steel), the limitations of existing materials make the achievement of good fuel element characteristics extremely difficult. Drawing upon its existing materials research and development capabilities and background of producing fuel elements for a variety of reactors, The Martin Company has sponsored an independent program for a number of years directed toward the fabrication of suitable nuclear fuel elements for rocket reactors. This is part of a broad Martin program designed to help meet our national goals of testing the first nuclear flight system by 1966–67.

Test of a fuel element in a plazma jet chamber being conducted at Martin's Nuclear Division.

MARTIN

C. W. Borklund .....Publisher

C. Paul Means .....Managing Editor
James Lewis .....Editorial Assistant
William H. Martin .....Art Director
David Ross Robertson ...Asst. Art Director
R. Virgil Parker .....Production Manager
Floyd G. Arpan .....Editorial Consultant

★

Business Staff

Elsie Gray ....Advertising Service Manager
Carolyn Huber .....Production Assistant
Eugene White .....Circulation Manager
George Peterson .....Cir. Fulfillment Mgr.
Richard Gibson .....Marketing Director
Donald E. Fullam .....Asst. Marketing Dir.

★

Regional Advertising Offices

New York 17, New York
Ray Quirk, 20 East 46th St., YUkon 6-3900
Beverly Hills, Calif.
James Claar, Edwin Denker, 8929 Wilshire Blvd., OLeander 5-9161
Chicago 2, Ill.
Lenn Franke, 139 N. Clark St., CEntral 6-5804
Detroit 2, Mich.
Ken Wells, 412 Fisher Building, TRinity 5-2555
Geneva, Switzerland
Anthony Vandyk, European Director, 10 Rue Grenus, Phone 321044, Cable AMERAV GENEVA
London W.1, England
Frank V. Norall, Norall & Hart, 28 Bruton St., GRovenor 8356
Dallas, Tex.
202 Wynnewood Professional Bldg., WHitehall 3-4266
Miami, Florida
208 Almeria Avenue, HIghland 4-8326
Paris, France
Jean-Marie Riche, 11 Rue Condorcet, TRU 15-39

★

Published monthly by American Aviation Publications, Inc., 1001 Vermont Ave., N.W., Washington 5, D.C. Telephone: STerling 3-5400.

Wayne W. Parrish .....President
Leonard Eiserer ..Vice Pres. and Gen. Mgr.
Fred S. Hunter ....Vice Pres., Editorial Dir.

★

Unsolicited manuscripts should be accompanied by a stamped, self-addressed return envelope. Armed Forces Management does not assume responsibility for the return of any unsolicited material.

★

Published monthly by American Aviation Publications, Inc., Washington, D.C. Printed at The Telegraph Press, Harrisburg, Pa. Accepted as controlled circulation publication at Harrisburg, Pa. and Washington, D.C.
Copyright 1961 by American Aviation Publications, Inc. Reg. U.S. Pat. Off.
Four weeks' notice before next publication date required for change of address. Subscription Price: $10.00 a year in U.S. and Canada, $15.00 overseas, single copy price $1.00.

THE FOLLOWING WAS SENT IN by a Procurement Officer, who noted: "It's encouraging to us in the field to know someone defends us against undue criticism in trying to do the Defense Procurement job. The enclosed article (origin not known) seems to tie in with Par. 2 of col. 1 of page 38 of your June, '61, issue."

Home of The Brave

YOU MIGHT SAY this piece is something of a tribute . . . a tribute to those 9 out of 10 contracting officers who must be among the bravest people in all America.

Why any red-blooded American would take the job of Contracting Officer for a military service—except at the point of a gun—is something we have yet to understand.

This year, such men have the responsibility of spending a major chunk of our $44-billion defense budget. Their number one assignment is to buy the biggest bang for a buck. Except not everybody remembers that fact.

Instead of being free to go out and find the best supplier for whatever kind of weapon or material Uncle Sam needs—and use their judgement to drive the best possible bargain—these fellows have more "instructions," "regulations" and "policies" to follow than any human being could even hope to read if he took night and day at it for a solid year.

Yet Contracting Officers are like umpires and baseball managers. In fact, a rhubarb on the ball field is like a Thursday Afternoon Sewing Society meeting compared with the noisy second-guessing that goes on behind our military purchasing boys.

Did they make a set-aside for small business? Fine, but why didn't they give the order to the bigger firm in the distressed labor area? It should have been advertised. It should have been negotiated. Only one company knows how to make it. Any company can make it. This company can make it on its own equipment. But this other company has a floor full of government-owned equipment that will be idle if they don't get the order. A better product? Can't use it; it doesn't fit into our standardization program. "Why can't more contracts come into my State? My State has just as fine workers as any State in this Union." "You are hereby directed to cancel the award and re-award it to the low bidder; we agree the low bidder is probably lousy, but you haven't proved he is too lousy to get the business." "It is the Contracting Officer's responsibility to consider many factors other than price in deciding which company shall receive an award."

"Negotiation of profit involves a fair evaluation of all the factors entering into the contract." "Don't let anyone get more than 2% over allowable cost."

If we sound like our tongue is in cheek, it's the only way we know to portray something of the really serious problem that exists in America's military buying program. What we buy and how well we buy it means the difference in our military strength.

Capable contracting officers could name their own salaries in private industry. Poor ones are no good to anybody. But we'll never know which is which unless we set some fair standards and leave the good ones free to do a job. Constant fear of harassment and criticism for a single misstep in the tiptoe path through conflicting policies is a near certain way to make sure that no one can succeed. To the brave ones who keep on trying . . . our sincere respect.

Anonymous

TACAN ACCURACY RIGHT OFF THE SHELF

See Preview Showing at WESCON Exhibit Booth 1615

TACAN test equipment from the world's largest maker of airborne TACAN

Hoffman now offers a new and complete line of specialized test equipment necessary to maintain TACAN accuracy in the field—thus insuring the superior performance built into airborne TACAN equipment. Compact and rugged Hoffman simulators are available as standard off-the-shelf items (federal stock numbers assigned), and at lowest cost. Equipment tests all airborne TACAN models now in use.

HLI-119A (AN/ARM-25)
Radio Test Set

JANized portable unit radiates simulated ground beacon signal to check accuracy of any model TACAN (while operating in aircraft) for range, bearing and identification signals. Also checks power and sensitivity. Federal Stock No. 6625-724-8868.

HLI-103B
TACAN Beacon Simulator

Simulates functions of TACAN or DME surface beacons to enable maintenance men perform complete laboratory and bench tests on all model TACAN sets. Federal Stock No. 5625-668-4227.

HLD-129
Azimuth Error Analyzer

Detects and provides visual and recorded indication of static and dynamic tracking errors in azimuth portion of TACAN sets being checked by HLI-103B.

HLI-116A
Peak Power Calibrator

Measures peak output power of TACAN transmitter in kilowatts without use of calibration charts or auxiliary equipment.

HLD-141/144/146
Instrument & Power Panels

Simulates aircraft wiring in testing all AN/ARN-21 and ARN-65(V) TACAN sets and instruments removed from the aircraft. Federal Stock Nos. 6625-724-9938, 6625-448-7172, 6625-448-7177.

Send for complete data file on Hoffman TACAN test equipment and TACAN air navigational systems.

Hoffman / ELECTRONICS CORPORATION
Military Products Division

3740 S. Grand Avenue, Los Angeles 7, California • Richmond 7-4488

SIGNIFICANT DEVELOPMENTS AT HOFFMAN HAVE CREATED POSITIONS FOR SCIENTISTS AND ENGINEERS OF HIGH CALIBER, PLEASE ADDRESS INQUIRIES TO VICE PRESIDENT, INDUSTRIAL RELATIONS

ARMED FORCES Management

PUBLISHED FOR THE MILITARY SERVICES OF THE FREE WORLD

AUGUST, 1961

Volume 7—No. 11

FEATURES

How to Clobber Communications 14

A representative of the advertising industry warns that elimination of the advertising allowability benefits of defense contractors could strangle communication between the military and their industry partners.

Progress Report: Hitch's New Look at the Budget 18

In an exclusive interview DOD's Comptroller relates plans to make the budget relate costs of weapon systems, tasks and missions, and of the attempt to integrate planning and programming with financial management—eliminating arbitrary ceilings.

Re-organization or Re-orientation? 21

Re-organization isn't always the solution to sound management. Re-orientation almost always can solve the problems.

It Always Pays to Save Money 23

Success of the cost-consciousness campaign at the Army Ballistic Missile Agency may provide pointers for other commands.

NATO Firms Tool Up To Produce F-104G Starfighter 28

AFM's Geneva correspondent Anthony Vandyk gives an inside report on the Lockheed-European F-104 program and its excepted progress in the future.

Crash Programs: Can They Provide Needed Weapons on Time? 31

Maximum decentralization, minimum committee operation, minimum red tape, maximum priority, and adequate authority are needed.

Pentagon Profile—
This Month: Defense Comptroller Charles J. Hitch 34

The top money-man at DOD has devoted ten years of thought to the economic implication of cold war military problems and weapons systems, has also found time to write three books, the latest of which has become a Pentagon "best-seller." His goals, if successfully carried out, will allow him to give program approvals as far ahead as five years, something that has never been done in DOD.

Progress Report On: Mark Bradley's Money Tree 39

Periodic Service drives to increase efficiency are nothing new to the military. What is new: the amazingly high level of enthusiasm Air Force's project Money Tree has created.

Managing "Thinkers" Take Time, Talent 44

Here are some pointers on developing an atmosphere favorable to creativity.

DEPARTMENTS

Editorial 5	NATO Forecast 25	Procurement Trends 47
Washington Background 9	Research Rundown 37	Association Newsletter 49
The View From Here 11	In My Opinion 43	Advertisers Index 50

NEXT MONTH:

Progress Report on ICBM Site Activation . . . Computers In Single Managerships . . . Single Manager for MATS, MSTS and MTMA . . . Procurement Coordination of the Space Program . . .

New 10-place jet trainer

The Lockheed C-140 is a compact jet transport. It flies fast and high like jet fighters and interceptors – at just a fraction of their operating and maintenance cost. It can train an entire class of students for hours at a time, rather than one man for a few minutes. And students learn the fine art of operating radar and weapon control systems in tactical and strategic aircraft in a favorable environment, because the C-140's entire cabin is pressurized and air-conditioned. Students see the real thing on their radarscopes and instruments. The Lockheed C-140 also can stretch defense dollars when used for navigational aids checking, casualty evacuation, aerospace system flight testing, and for high priority cargo and passengers.

LOCKHEED GEORGIA

Lockheed Aircraft Corporation, Georgia Division, Marietta, Georgia.

Washington Background

The Jerry-Built Substitute: Dromedary

Military experts are viewing with scorn current Defense studies on what they need in the way of strategic manned aircraft which can (1) escape a missile attack and (2) be capable of effective retaliation. Raffled when OSD cancelled ANP as "just no good," they threw up their hands in frustrated dispair when an announcement later came out that said, in effect, "we need an aircraft that will (do all the things ANP would have done) but we need it in a hurry and we need it for 10% of ANP's cost."

Latest development has them really snorting over this "nutty exercise in rationalization." The new twist: Air Force is checking into the possibilities of utilizing a sort of jerry-built version of Dromedary which would fly lower (25,000 feet), slower (200 mph), and for less time (3 to 5 days maximum) than ANP (would amount to little more than a flying gas tank and, presumably, would therefore have far less payload capacity).

Budget Plan Hits Snag

Responsible officers up to and including Defense budget comptroller Hitch (see Pentagon Profile this month) have been concerned for some time that he may be trying to do too much too soon in what they all accept as a sound, fresh, logical approach to Defense budget problems. Said one, six months ago, "I don't see how you'll be able to handle even the detail work without a computer and, as far as I know, none of the people in charge have any idea what it takes to turn a computer into a management tool."

First evidence cropped up last month that both potential roadblocks were valid: (1) Hitch's programming office tried to get some time on one of the service computers in the Washington area, inferred that they couldn't meet their deadline for collating a mountain of statistics otherwise; (2) not even found when they asked EDP for help that the computer experts could only shake their heads. Reason: no thought at all had been given by the asking agency to the fact that a computer won't work without a program—and it takes considerable amount of time, effort and thought to write one of those.

Outlook: Hitch's timetable is in trouble.

West Berlin Has Pentagon Gloomy

A growing group of military theorists are privately voicing long-faced resignation over the probable fate of West Berlin. Background: far more military top personnel than is generally realized have, in the changing military environment of recent times, become considerably expert in political and sociological matters.

Best summation, from one high ranking officer: "we are basing all our plans on the fact that if we don't back down the Russians are going to start a fight. Or, conversely that if we indicate we will fight, we won't mess around. Only trouble is, they can squeeze us out with harassment tactics without ever firing a shot. How can we possibly start a war just because the East Germans are going to close the railroads into Berlin in order to 'inspect the tracks'?"

What's Ahead For Limited War Forces

Rand Corporation, the West Coast brainpower firm which does thinking on assignment from the services, mostly, has reportedly launched an extensive study into what Defense needs to beef up its limited war forces, and how much the tab will be. First slice at the problem came up with an extra $5-billion price tag. Pentagon shuddered, said maybe we could do it cheaper.

But, predicted one counterforce expert (see March-April-May AFM and following) "they'll get back to it. They've run into a fiscal stone wall here, but when they turn back to the minimum deterrence nonsense and realize that is a stone wall too, they'll go back to limited war beef-up proposals with a 'we know it costs more, but . . . .' philosophy."

Follow-up prediction: with the Administration rapidly backing itself into a strategic thinking corner where it either pays the extra limited war freight or buys nothing but frustration, chances are they will reluctantly ask Congress to pay the bill. Result: talk may become prevalent in the next few months of a Defense budget zooming as high as $100-billion by 1975.

ARE YOU PAYING FULL-TIME PRICE FOR A PART-TIME COMPUTER?

Only the asynchronous PHILCO 2000 works full-time for you!

All other computers are slaves to an internal timer . . . they *wait* between operations. The Philco 2000—the *only* asynchronous computer—is free to flash from operation to operation with no delay. Result? The fastest, most reliable computer in the industry . . . the computer that works full-time for you.

This is how Philco gives you more for your computer dollar!

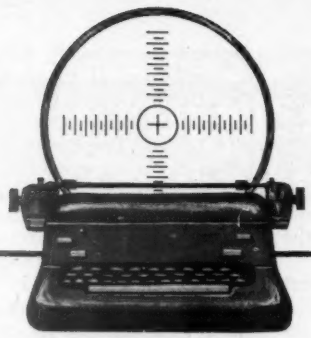
Count on Philco for leadership . . . in computation and in total customer services and support.

Let us tell you more. Write today.

PHILCO

Famous for Quality the World Over

PHILCO CORPORATION • GOVERNMENT & INDUSTRIAL GROUP • COMPUTER DIVISION 4900 WELSH ROAD WILLOW GROVE, PA.



The View From Here

Perfection

Tucked away in one corner of the Pentagon's spacious executive suite 4E871, Office of Air Force Secretary Eugene Zuckert, is a golf club with a "bendable" shaft (designed for ardent golf fans, as Zuckert is, club has a kink in the middle of the shaft. If a living room practice swing goes right, the shaft stays straight. If on the other hand, the golfer's form is off, shaft whips out of shape like a chicken's hind leg).

Frequently; when Gene Zuckert becomes vexed by some problem more than he feels any man ought to have to put up with, he will grab that club, walk to the middle of the room, and work out his frustrations by chopping away at the air.

One day last month, while performing this ritual, (following an obstreperous phone call from Capitol Hill), he commented to no one in particular, that "the big trouble with working for the government is that all that's required is perfection."

That one idle remark prompted (1) at least three people to type it, paste the slogan on their Pentagon office walls where visiting Congressmen would be sure not to miss it and (2) one listener to write these four paragraphs.

Security Snafu

There was a time, not too many file dates ago, when the Nation's Press used to say, of Pentagon information policies, "nothing could be this bad." Recently, they've changed their minds, now bitterly contend "the whole operation is getting ridiculous."

Respectfully we submit that the newsmen are too close to the forest. Even though the whole system has become an unfunny comedy of confusion, the new front office has every right to indicate, as it clearly has, that it: (1) is determined to make all the same mistakes the Pentagon made here six years ago; (2) can't decide whether the lid will go on or come off information dissemination; (3) has no idea stated new procedures, which themselves are contradictory, are being translated, in practice, into a nonsense easily as funny as Bob Hope. Certainly the new Administration has all the authority it needs for such inane behavior—provided it doesn't mind looking a little silly.

Item: Under the guise of being "contrary to policy," more controversial stuff is being swept under the rug, more legitimate (albeit uncomplimentary) opinions are being smothered, than probably even the top men realize. (Main reason: although the "E" ring publicly stated, at first, that the public had a right to know, they later told the military, in effect, "but don't you tell them.")

Item: Security is so snarled in contradictory orders that the Services have taken to sanitizing everything before it even gets to OSD for approval. Two results: (1) what does get printed has a very high pap count; and (2) "privileged" information is beginning to mean "just about anything." (In more logical times real *military* security was wrapped up only in not revealing *how* we did certain things, not in merely telling *what* we could do. As a matter of fact, outlining U.S. prowess used to be a key part of making sure Russia didn't over-calculate her chances of success—assuming always that we really could back up what we claimed.)

Item: As they did several years ago, OSD is trying again to consolidate all information services of the military into one big office. Pointed out one general, as was mentioned the last time around, having one mouthpiece is neither very clever, nor very sensible, nor very economical—as long as there are in fact three separate military services with, in the great bulk of their work, different, dissimilar information and education problems.

Item: The inference in recent public statements that certain stuff released in the past shouldn't have been and therefor won't be talked about anymore—because "it jeopardizes our security"—is a dumb comment on the face of it.

A well-informed Fourth Estate can be a powerful assistant to Defense operations. The current "ninny" treatment could well turn them into a powerful roadblock. And once all the doors are closed in their faces, once they have to start "assuming" a lot of information, the American people are going to be served up a real warmed over, indigestible mishmash.

If the Pentagon thinks it had troubles with the Press six months ago, wait until it falls into *that* bowl of soup.

Birdland

Because many of its crusades for voter favor in the past have been error-filled, the U.S. Congress has frequently been likened, by Washington natives, to the hundreds of pigeons which flit about town in nervous, seemingly aimless flight looking for nobody knows quite what.

One of the better bits from birdland recently was the House Appropriations Committee buckshot blast at Defense "management soft spots."

To prove, inadvertently, that their vision can grow pretty badly blurred at times, they managed (before sending the Defense Appropriations bill to the Senate) to toss these poorly made mud pies:

1-Scorned government agency use of "over 315 non-profit corporations and organizations" to do work for the government, argued that these procedures are "creating considerable additional cost to the taxpayer," and something must be done before "tremendous injury results in vital Defense programs and programs of other departments and agencies of the Federal Government."

The occasional fact they used to support all this blustering was reasonably valid but their outline of the total problem was about as close to being accurate as from here to breakfast.

These columns have long echoed the argument of military personnel experts, in effect: "if we paid the people in Defense what they are worth, we wouldn't have to hire outside the talent we must have, our turnover problem would disappear and the Government would save literally billions of dollars in training and operations costs."

2-Called for more Defense contracts to be awarded specifically on a "formally advertised competitive bid basis," and warned that this statutory policy

"must be implemented and not bypassed as has been done to date." (For the real facts on this nonsense, see "The Positive Side of Procurement," June, '61, AFM.)

3-Arbitrarily cut the operations and maintenance budget request of Defense (for the second year in a row) to emphasize their sharp criticism of "shocking" examples of *military* waste.

(Defense Secretary McNamara agreed there were "horrendous examples of waste" in the military establishment, added he could find equal waste in big industrial concerns, said that pointing the finger at the Pentagon was "distortion," contended what made far more sense than the House: the war on waste must be fought by both halves of the defense-industry team and trying to make one or the other a scapegoat mostly just fogs up the issue.)

Headline Hunters

It is hardly any secret in Washington, D.C., that nearly all Congressmen know which side of the newspaper headlines their votes are buttered on.

It is also hardly any secret that they have almost unabashed admiration for anyone outside the club who can attract nationwide attention every time he opens his mouth. One of Congress' favorite witnesses is Vice Admiral Hyman George Rickover, a bantam-sized fighter with a voice as big, and as devastating, as all outdoors.

Although Rickover can raise an awesome amount of dust every time he knocks over somebody's windmill, ordinarily, the cloud is kept under control by a handful of men on Capitol Hill.

Unfortunately, if the headline explosion is big enough, that handful of Congressional experts is sometimes outflanked, put in the position where they must either go along with the carnival or run the risk of looking, to the voters, as if they were in favor of sin.

This happened again earlier this summer when Rickover was called to the Hill, presumably to testify on the status of nuclear reactors. Instead, or in addition, he fired from the hip at nearly everything from academies to waste. And, like Wyatt Earp at the OK Corral, he put far more holes in the woodwork than the villains.

We have no intention of advocating abolition of Rickover's role as military sting bee. Quite the contrary. Lethargic, cob-webbed routine often needs this type of prodding.

Nor do we have any intention of declaring war on Rickover. It would be unfair. There are plenty of more talented people trying to find his throat now.

Our complaint is that Rickover's conscientious efforts to improve the way the military, particularly Navy, runs its operations gets cluttered up by his own supporting arguments.

In sum, one of his colleagues told AFM, "My friend, Rickover, has an almost amazing ability to leap off the right diving board and land in the wrong swimming pool."

Item: Noting that the Navy "seems to exist for career-planning to make certain that every naval officer has exactly the same chance to become Chief of Naval Operations," he contends that, "we should at once knock off this infernal rotation of military people." Far more officers than any one of the three services would like to admit will privately agree with him.

However, he hardly encourages a solution by adding that the system is a foolproof device for "evasion of responsibility" by officers who move in and out of jobs every few years. There isn't much more than a nut full of officers who are going to let themselves be saddled with that soap.

Nor does he help his cause much by contending that of the some 70,000 officers in the Navy, about 20,000 should be let go in the interests of improved naval efficiency. Even Defense Secretary McNamara felt compelled to comment that "that's an overstatement to say the least."

Item: And his comments on military education do very little to encourage other officers, who'd also like to see an end to some of the Pentagon's slipshod practices, to rally around. It is hardly logical to blame the Navy Post Graduate School for the fact that some of the officers it has trained have left to get better jobs outside the Navy.

And his two plus two doesn't seem to come out four when he urges "if drastic steps are not taken immediately to improve them," (without saying how) Congress should "abolish the service academies." For the record: the Naval Academy has already taken considerable steps to beef up its educational program, West Point has produced more Rhodes scholars than any other college except Harvard, Yale and Princeton; and the fledgling Air Academy as recently as last year placed among the top three in a nationwide "comprehensive education" examination of the graduating senior class of nearly 200 American colleges and universities.

Thus, McNamara's counter-punch: "Rickover is one of the world's greatest authorities on nuclear reactors, but I'm not sure I'd place him in that category on education."

Probably the best analysis of this whole can of worms came from a now-retired Navy officer who used to like to claim that he had a great deal to do with influencing Congress to protect Rickover—when the Navy top brass was supposed to be trying to squeeze him out. Following this summer's Rickover rhubarb, the retired officer could only groan, "My . . ., what have I done?"

Really Not Much

Savvy members of the Defense-industry team are notably, and understandably, reluctant to walk into the public limelight all by themselves with complaints about the way the business end of Defense operations is running—usually because they know full well just how frustrating an experience pumping adrenalin into bureaucracy can be.

But, occasionally, when a group of such like-minded men get together in one of that endless procession of conventions and symposiums which occur all year long across the country, a gripe or two will leak out. One did, recently, on the West Coast which provides a rather pertinent view on (1) how R&D programs should (or should not) be handled and (2) the U.S. relationship to NATO.

This back-and-forth was between former Assistant Air Force Secretary Courtland Perkins and Bell Aerosystems Company engineer J. A. O'Malley.

Perkins threw the first pitch: promising concepts should be kept in research and development phases where the money is, adding that, "a sure way to kill a program is to submit it to the Air Force as a weapons system."

O'Malley fouled that one off by wondering out loud why both Air Force and Navy, acting very interested at first, later cancelled his company's supersonic V/STOL fighter-bomber design—even though such a weapon is supposed to fit counterforce strategy very well and few U.S. companies are doing much in this area.

Clearly taking a dim view of the cancellation, O'Malley questioned the wiseness of (1) erasing an investment of 600,000 man hours, (2) passing up an opportunity to supply British French requirements for similar V/STOL (saving them the expenditure of talent and money), and (3) the military's lack of vision on a project which will be greatly needed in a predictable future shift of combat conditions.

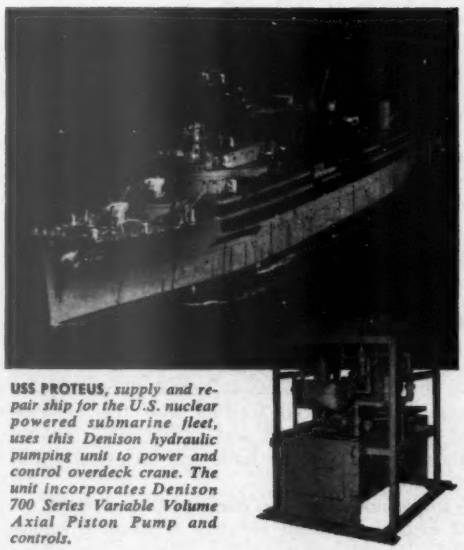
Perkins countered with a high fast one: "The Air Force just did not think enough of the aircraft to want it." O'Malley knocked that over the wall with: "Well, it really wasn't much of an airplane. It just weighed 25,000 pounds, had a combat radius of 1,000 miles, and could only fly at mach 2."

Denison and Denison HydrOILics are registered trademarks of Denison Eng. Div., ABSCO

DENISON HydrOILics

DENISON hydraulic power controls overdeck service crane aboard nuclear sub tender...

PROTEUS



USS PROTEUS, *supply and repair ship for the U.S. nuclear powered submarine fleet, uses this Denison hydraulic pumping unit to power and control overdeck crane. The unit incorporates Denison 700 Series Variable Volume Axial Piston Pump and controls.*

USS PROTEUS (AS-19) is the newly converted mother ship to our expanding ballistic missile submarine fleet . . . America's first line of defense. Converted by the Charleston Naval Shipyard from a conventional sub tender launched in 1943, *Proteus* is specially fitted for supply and repair of Polaris-firing nuclear submarines. The ship is presently based at Holy Loch, Scotland, carrying out her vital mission.

Denison hydraulic pumps and controls were specified for the overdeck servicing crane built by Skagit Steel & Iron Works, Sedro Woolley, Washington. Denison personnel worked with Skagit engineers to develop and build the special hydraulic control circuit.

Important hydraulic requirements were *precise synchronization* of the hydraulic cylinders and *positive, automatic control of speeds* during switchover from hauling to overhauling loads. Denison hydraulic components are handling this critical job reliably . . . assuring smooth, troublefree operation and ease of control.

Denison hydraulic pumps and controls are engineered to deliver low-cost fluid power for every marine need—steering systems . . . hatch covers . . . cranes and winches . . . many others. Your nearby Denison Hydraulic Specialist can help you save time and money on *your* marine hydraulics problems. Write for details today.

DENISON ENGINEERING DIVISION
American Brake Shoe Co.
1284 Dublin Road • Columbus 16, Ohio

HYDRAULIC PRESSES
PUMPS • MOTORS • CONTROLS

DENISON
HYDRAULIC POWER

A Survey on

How to Clobber Communications

William F. Hurley's opinions on the advertising allowability subject can hardly be discounted as those of a crystal ball gazer with no practical experience. A graduate of the Kingsport merchant marine academy, he was once the youngest ship's captain in the nation. Sunk twice, wounded once in World War II, he was involved in the Israel infantry in 1947, and in the Indonesian infantry in 1948, returned to being a ship's master in 1950 to run the blockade into China.

Since then, he's settled down to the relatively quiet life of being an advertising manager, living in Huntington, N.Y., raising four children (3 boys and a girl) and relaxing by hunting and sailing.

The reason for his hard-hitting comments here: give Defense decision making personnel some insight into how the industry side of their team feels about the whole debate.

Ad Man Bill Hurley . . . .

Given: that the "Defense-Industry team" concept is potentially the most sound, productive method of successfully utilizing a democratic nation's economic strength (as Defense says it is) in waging the cold war.

Given: that the industry half of this "team" is just that, half the team.

Given: that common sense, if not smart business management, demands that to draw most effectively on this industrial base means Defense must do everything it possibly can to see that it is fully informed on her needs and plans—in order that it can (1) be current on the most applicable industry developments; (2) see that requirements are filled most efficiently and accurately.

Given: that only a small minority of us are thieves—and most of those are already in jail.

Quandry: why then does Defense sometimes and Congress frequently seem determined, inadvertently or by design, to dam up the only channel which will make this "team" idea work—Communications.

That problem has been bothering a lot of people in Defense industry of late. Most recent example of the unnecessary burden, they say, is the trumpeted blast over Defense advertising allowability fired off by the House appropriations committee a few weeks ago.

This bomb has shoved industry respect for its Defense "captain" just a little bit deeper in the hole, will tend, if passed by the Senate, to make it just that much harder for industry to operate wisely—at the very time when Defense Secretary McNamara is demanding they do just that.

With implications potentially as dangerous as that and a large share of of industry now feeling this way, AFM went to one of the experts in the Defense-advertising-communications field for some opinions—a procedure, incidentally which our more vitriolic Congressmen rarely bother with when they let fly.

While the man, William T. Hurley, is expressing his opinions *as an individual*, and not as a representative of one of Defense's leading contractors, he doesn't stand alone. Put to a vote, his point of view would win an industry election easily.

From the unheard side of the hassle:

Q. Is Defense industry advertising of any value to Defense and National Security? If you think so, why?

Defense industry advertising is almost the sole support of the only real means that exists in our overall Defense setup today for effective military-industry-wide communications. Modern Defense has required such a high degree of specialization that we no longer have the arms manufacturing arsenal type team.

Today, we have data processing, electronics, missile, aircraft, munitions makers all feeding into the Defense structure. No single DoD report and/or technical bulletin could possibly replace the many trade and technical publications now in the field.

Q. What's so important about this communications field?

Defense at large has forced industry to develop highly specialized skills. In this era there is hardly any such thing as for instance an electrical engineer. He is an instrumentation engineer in electronics. In some instances, we have less than 100 engineers specialized in one particular area vital to national defense. Each requires a fantastic amount of communications in his field—and the technical press is the only place where he can get large doses of it.

Q. Probably as a result of Defense industry advertising in so-called general consumer publications, some Congressmen complain: "Because the public is not in the market for missiles, Defense industry should not be allowed to advertise." How do you feel?

Who's on the Team?

FOR MORE THAN A DECADE now, Congress and the U.S. Defense establishment have lauded the paramount value of the "Defense-Industry" team. And have shown, generally, that they were not playing to the gallery but really believe what they say.

The Air Force went to industry for the technical answers when they had to have a missile in a hurry, the Navy when they had to take the missile to sea and put atomic powerplants in ships, NASA to put a man in space, Army to modernize for nuclear war.

Only a nut would contend that the U.S. can effectively wage a cold war without a strong, efficient, alert industrial base. The sheer size of it is a large share of the reason we manage to keep the communists in sight at all in this race. It has, in fact, become so integral to successful military hardware development that one highly placed Pentagon official starts out all his symposium speeches now with, "Good evening, fellow government employees."

On any team, the players can neither stay sharp nor perform well unless they get the word from the quarterback. Yet, precisely in this area—Communications—there appears to be a concerted, unchecked effort to choke off the signals. Or so it would seem.

This onerous overtone has begun to pervade the whole National Security effort, is plumped in its most idiotic fashion by a handful of Congressmen—who have gotten away with far more than they deserve only because the taxpayer can't, and knows he can't, gain access to all the information necessary to make an intelligent judgement on his own.

It has happened already in the continuing small business "problem" where Congress appears to be working hard to protect the little guy—and actually is forcing Defense into procedures which are really destroying, and not aiding, small firms.

It has happened in the "officer-hiring-by-industry" debate where Congress' trumpeters inferred they were cleaning up a dirty situation when in fact they were drying up a source of knowledgeable talent industry needs—to stay current with Defense thinking, thus knowing how they can most effectively con- tribute.

It has happened in procurement where GAO reports, aided by the marvelous infallibility of hindsight are struggling to prove that both Defense buyers and industry suppliers are, through stupidity or design, trying to steal the public blind.

It has happened in the renegotiation business where industry has been told, in effect, "We don't care how much you waste on costs. We'll pay that. Just don't make a profit." Even though profits, as most any high school boy knows, are supposed to be the economic lifeblood which, ultimately, keeps the Defense industrial base strong.

It has happened far too often of late. And almost always the headline hunters launch their thunder with the "granted" premise that there is a rodent in the rockpile, that, given a choice, nearly everybody will cheat rather than be honest. (Logically, if this is so, then morally a very large share of what we're scrambling to preserve isn't worth preserving at all.)

It has happened again in the advertising allowability hassle of recent weeks. In all these cases, noisy drumbeaters along the Potomac have an amazing ability to see only half a picture, understand little of that but sound like experts on the whole problem anyway.

Ordinarily, a very important handful of key Congressmen, who've spent a lifetime studying Defense problems, can keep the lunatic fringe under control. Unfortunately, the latest impeachment was slipped onto the squawk box before these informed legislators could call a halt. Now, just as unfortunately, the latter can hardly give their ignorant colleagues the public primer lessen they should without appearing to oppose God and Mother Love and be in favor of sin.

Few informed observers have ever felt that any specific problem of the Defense-Industry team relationship was all black and white. Pentagon veterans have known for a long time that most of the field is grey. In fact, the hoped-for ability of the New Frontier team to thread their way through this nebulous area of critical headaches with fast, comprehensive decisions was the prime basis on which their coming was viewed with such anticipation.

It's not working out that way.

One very big reason is the simple, obvious and vital hurdle of communications. A good share of this might be written off to lack of team experience. But certainly, the obstacle isn't going to be any easier to jump later on if Defense itself helps build it higher now.

And it is an indication of just what kind of bad shape the Defense-Industry communications network is in that even many of the men who will render decisions in the advertising area don't see the basic connection between the one and the other—nor comprehend how crippling the use of the latter will hamstring the former, as Bill Hurley outlines in the attached article.

To really understand that requires a knowledge of something called the "Business Press" and even many people in the publishing field haven't grasped that yet. It is this area which will be most hurt if the heretics have their way.

And it is exactly this communications medium which is performing an almost inestimably valuable job in disseminating information among the important members of the preparedness team—a job, in both editorial and advertising messages, which industry management itself frequently underestimates. (To assume that the same information can be, and is being, spread just as efficiently in other ways is wondrously naive and optimistic.)

In its own self-interest, Defense should lean hard to show where certain Congressmen have erred. And Capitol Hill inhabitants should be told in clear terms that, in trying to attract voter attention by painting one more picture of purportedly adulterous behavior, they do the nation far more harm than good. They should also be told that:

(1) The way to solve a problem is not to eliminate it;

(2) Not since Adam first had apple problems has man been able to figure out a way to legislate morality. And every time he's tried, he's managed only to penalize the 98% who weren't doing anything wrong in the first place.

The Trade Press is Necessary . . . .

I agree that Defense advertisements should not be encouraged, and aided financially, in commercial outlets and/or media. The simple reason: it serves *industry* nothing but a public relations purpose. Certainly, the public is entitled to know what is going on and when and where and how. But this should not be the responsibility of individual firms with limited funds, tight income and no authority to explain the total picture.

Q. Defense itself, at taxpayer's expense, publishes a great many magazines that contain information of a trade or technical nature. Can't they do the communications job?

Aimed at scientists and engineers they can be quite important. However, in my view, they do not give the day-to-day interpretation of the needs of military security. To do so adequately would require that Defense go into the publications business on a scale no taxpayer would approve.

Q. As a general rule, which type of publication should be more valuable in the total communications chore: internal Defense magazines or private trade papers?

One only has to read the daily press to see that the military has an extremely difficult job in internal communications right now. How can we expect them to communicate with industry—particularly at the technical scientific and engineering level? I see no other way at present that Defense can reach and be reached by industry at anything approximating the degree of capability provided by technical publications.

(Besides that, these people are as human as you and I. They want their information presented in attractive and not dull directive form—and they are much more likely to read it that way.)

Q. Why do you advertise in these media?

Basically, because we believe strongly in the communications quotient of the business press media. And the only way such media can function is through advertising financial support.

Aside from this, there is a business factor—military and industry communication with each other in various fields, R & D, etc., and briefings on the current thinking in National Defense. (From a company standpoint, "If I make a better tube cheaper, more reliable than the next manufacturer, certainly it behooves me to advertise the fact. It benefits me and it benefits National Defense at large.")

After all, we in Defense Industry are interested in getting across our advertising message to (1) support the specific publication's value and (2) show our own intrinsic technical and scientific capabilities.

Through a government press (which crippling advertising implies in this field) this industry message could not be spread. And, finally, the chief reason this subject comes up at all is that Defense industry advertising is not viewed as it should. The primary concern in viewing advertising should be to look at its support of Defense-Industry communications rather than as solely a matter of getting a sales message across.

Q. Could the communication function (which has been the basic reason behind Defense allowability for advertising up until now) be performed by Defense in a cheaper way?

No. In order to perform the function DoD would have to enter the communications field on approximately the same basis as presently exists with the trade press—which financially would cost far, far more than what they would eliminate in advertising space sales cost.

Printing and production costs are the real hurdles in magazine creation, costs which would be incurred by Defense if they took over the job. Result: the costs to the taxpayer would be easily 10 times what they are now to perform what apparently and justifiably all knowing people in the field recognize as an absolutely necessary function.

Q. Some Pentagon officials feel that, through lax application of the ASPR's they have encouraged the existence of many "marginal" publications. Do you believe this is the main reason there are so many more magazines today than there were 10 years ago?

My "yes" answer must be qualified by stating that one must evaluate what is "marginal" in a field so vital. Every other industry endeavor today has its news and technical data media, for direction and intelligence.

Certainly, by indirection, some "marginal" encouragement has gone on. But I do not feel that this is the chief reason there are so many Defense business papers today. To reiterate, the prime cause is Defense demand, through need, in so many now highly specialized areas. Increased specialization automatically increases the need of specialized scientists and technicians for specialized information. Only the business press can fill this need.

Q. If you feel it's valuable for Defense industry to advertise, why shouldn't they foot the whole bill?

Simply because Defense industry is engaged in a field where, like no other, their income is limited—to 6%. In the commercial side of this business there is no limitation at all. Thus, in Defense, it would be a financial impossibility for corporations to project their images, wares and personnel talents to the Defense people who need to know, without assistance from the government.

(I might add that for some reason it is currently the opinion that those engaged in Defense industry are operating on highly profitable ventures. This is usually not the case. Actually, those in the Defense field are there basically because of a sense of national purpose.)

Q. What types of advertising should Defense help haul the freight on and why?

I am strictly against Defense helping to pay for product sales ads, for the reasons I've noted above. Capability advertising, and its variations, yes, because it's of value to the community. Such things as recruitment, scarce materials, etc., because it is an economical way to help carry out a specific contract, yes. Other than that, no.

Q. What do you think the impact on Defense communications of all this adverse public comment toward advertising will be?

Detrimental, at least. It could create in the public mind a picture of a "Arms maker" of the distant past who "profiteered on wars and human misery." Certainly this is not even close to an accurate description of Defense industry today.

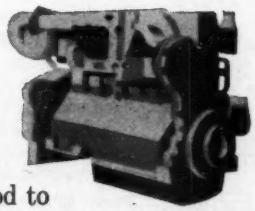
Q. Do the public statements indicate that the critics of Defense advertising know the field they are attacking?

No. In my opinion the people attacking Defense industry advertising could not know much about the field—just from what their publications statements indicate. It's all very well and good to attack advertising as "waste" in the Defense effort—until you look at the background. When you realize that it supports and is itself a communications media aiding Defense, tell me how I'm wrong in concluding that those who attack it are grossly uninformed.

Q. Why do they keep bringing it up every year?

It is incumbent on elected legislators to show their constitutents, who unfortunately haven't the information channels themselves to keep them informed on Defense communications and procedures, to show their voters that they are "cutting the fat off the defense budget." And they feel they are required to do this yearly, even though occasionally, as in this case, the procedures they propose are entirely unrealistic. ■

Capability in Power and Mobility for defense



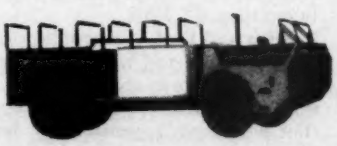
Problem: To develop more horsepower without increasing diesel engine size. *Needed:* A new method to increase fuel burning capacity without robbing engine horsepower. *Developed:* A responsive turbocharger being used in Caterpillar's compact, high horsepower diesel engines. This advance in engine efficiency was the result of a Caterpillar research group which devoted itself exclusively to turbo study and testing. Today, the company is one of the world's leading authorities on high-speed rotational phenomena, the problem and their control. • In conjunction with turbocharger manufacturers, Caterpillar has also pioneered in the field of turbocharged engine performance and proper matching of turbo and engine. As a leading manufacturer of heavy equipment, Caterpillar has outstanding resources in research, engineering and manufacturing. This experience, talent and manufacturing capacity are available for your vehicle, engine and component needs. Write for Bulletin No. 40-20265, Defense Products Department, Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WASHINGTON, D. C. PEORIA, ILLINOIS

RESEARCH • DEVELOPMENT • MANUFACTURING FOR DEFENSE



Progress Report:

Hitch's New Look at the Budget

DOD's Comptroller relates plans to make the budget relate costs of weapons systems, tasks and missions, and of the attempt to integrate planning and programming with financial management—eliminating arbitrary ceilings.

SIX MONTHS AGO, most observers credited the new top management team coming into the Pentagon with a "no nonsense" approach to Defense problems that was going to make "the fur fly." And rumbles along the Potomac have pretty well established that this time, for a change, the crystal ball gazers saw what they thought they saw.

One key area where this became immediately apparent has been in the handling of budgets. Privately, many military budget experts had long insisted that: "three separate military budgets didn't make much sense when we had, or were supposed to have, one military service; would only make sense when we started looking at programs in toto. Current budget development is a patchwork effort and until it is tied closely to plans and programs it is going to remain a confusing, shadow boxing effort."

All of this conversation had been thrown around before, but when Defense Secretary McNamara brought Charles J. Hitch in as his comptroller the word was already out on what this might mean. (See Pentagon Profile, this issue.) Noting, early this year, that the military had made tremendous advances in financial management since the end of World War II, Hitch added, however, that "the main lines of the financial management structure within which we now operate were laid down many years ago. Financial management tools forged in different times and for different tasks are not fully suited to the job they have to do today.

"The revolution in military technology since the end of World War II, or even since the end of the Korean War, has had a profound effect on the character of the military program.

How To Relate Costs

"The great technical complexity of modern-day weapons, their lengthy period of development, their tremendous combat power and enormous cost have placed an extraordinary premium on the sound choice of major weapon systems. These choices have become, for the top management of the Defense Department, the key decisions around which much of the Defense program revolves.

"Yet, it is precisely in this area that our present financial management system shows its greatest weakness. It does not facilitate the relating of costs to weapon systems, tasks and missions. It does not disclose the full time-phased costs of proposed programs. And, it does not provide the data needed to assess properly the cost and effectiveness of alternative programs.

"These weaknesses have been a matter of increasing concern to the Congress and particularly the House appropriations committee, as is evident from the committee's report on the 1961 Defense appropriation bill."

And it is precisely these weaknesses which are now Hitch's primary concern. Fountainhead for the Hitch effort to make sense out of and put real meaning into the Defense budget process will be the new planning and programming office he has set up.

Here are excerpts from his mid-April proposal, since approved, to Defense Secretary McNamara on what they will be doing in the budget area and how and why:

The fundamental objective of the

In Brief:

According to Comptroller Hitch, these five points comprise the key to the programming phase (termed a major innovation):

First, general policy guidance will be provided by the revised Basic National Security Policy paper which is now in preparation and which will be reviewed by the Secretary and his principal advisors in May.

Second, A requirement that as many programs as possible, certainly all of the major consumers of dollars and other resources, be identified on a mission or output oriented "program package" and "program element" basis.

Third, guidance will be provided on questions to be answered and studies and analyses to be performed in connection with the program review.

Fourth, as program decisions are made, some sort of benchmark will be needed to tell us where the decisions are leading us in terms of a total budget. We plan to use two controls. The first is the 1962 budget. For the second, we intend to ask the Services to cost out, in expenditures and NOA terms, the force structure submitted by the JCS in answer to Mr. McNamara's Project No. 3, that is the forces provided in the President's budget for FY 1962.

Fifth and final, a schedule for program submittals will be issued so that the Secretary and his advisors can examine and make decisions on program proposals in an orderly way over a period of several months. Submission of program proposals for review by the Secretary of Defense and his staff will begin approximately June 1.

new Programming office is to integrate planning and programming with financial management functions in order to provide better tools for decision-making by the Secretary of Defense and his military advisors; and to create a planning and programming/financial management system that is keyed to continuous program decision-making and not just geared to the annual budget cycle. In such a system, not only would budget decisions be program decisions, as they inevitably are now, but program decisions would be, explicitly, decisions to provide the resources to carry them out.

Getting The Facts

One important effect of such a system would be to reduce the wastes that have resulted from the fact that our plans and programs for future years have so often over-reached our resources and budget availabilities. This, in budget review after budget, has meant killing, curtailing or stretching out uneconomically programs on which vast amounts had already been spent. We need an economically realistic future program so that long lead decisions on program components will have a reasonable chance of turning out to be right.

Another important effect of such a system would be to allow us to get away from the arbitrary imposition of financial ceilings early in the budgetary process before major program decisions have been made.

To develop such a program, it is essential that the decision-makers have before them the total cost implications of alternative programs—not only total in the sense of cutting across appropriation categories, but also in the sense of being projected over the life of the program, or at least projected forward over a 5-year period.

Process Divided

Our ultimate goal cannot be achieved within a few months. However, we do want to go as far as we can in this direction in the decision-making process for the FY 1963 budget.

The traditional budgetary process will be divided this year into a programming phase (June to September) and a budgetary phase (October and November). During the programming phase the Secretary, with his military advisors and his staff, will examine a broad range of alternative programs and make decisions that will form the basis for guidance on the preparation of the budget. Attention will be focused on choice from among alternative programs to achieve our national security objectives.

For this purpose, cost and effectiveness comparisons will be made using largely statistical cost factors rather than the detailed information that must be submitted in support of the budget. The subsequent budgetary phase will concentrate on funding requirements to carry out the programming decisions. Because the programming phase is the major innovation, I will explain it in some detail.

Programming Phase

First, general policy guidance will be provided by the revised Basic National Security Policy paper which is now in preparation and which will be reviewed by the Secretary and his principal advisors in May.

Second, we would require that as many programs as possible, certainly all of the major consumers of dollars and other resources, be identified on a mission or output oriented "program package" and "program element" basis. By a "program element," we mean an integrated activity, a combination of men, equipment, and installations, whose effectiveness can be related to our national security policy objectives; as examples, we have in mind such forces as B-52 wings, infantry battalions, and combatant ships, taken together with all the equipment, men, installations, supplies and support required to make them effective military forces. By a "program package" we mean an inter-related group of program elements that must be considered together because they support each other or are close substitutes for each other. The Central War Defensive forces would be an example of such a package. The unifying principle of such packages is a common mission or set of purposes.

Total resource requirements for each of these program packages or elements would have to be identified, not only for FY 1963, but for 5 to 10 years into the future, depending upon the present phase and life of the program, and including not only RDT&E, procurement and installation costs, but also the costs of military personnel and operation and maintenance, and, where applicable, warhead costs.

The definition of a program element or package will involve both financial and non-financial factors; that is, a specification of both cost and capability. Costs will be expressed both in terms of expenditures and obligational authority. There is no thought at this time of abandoning the existing appropriation categories. Rather, our intention is to supplement them with program and cost information that is more meaningful for decision-making purposes.

Third, guidance will be provided on questions to be answered and studies and analyses to be performed in connection with the program review. Broadly speaking, we visualize four classes of questions, each to be answered by appropriate supporting analyses.

(1) There are questions regarding the forces themselves together with their associated weapons, equipment and installations. Do we want more, less, or the same amount of each type?

These examinations must be made in the realization that more forces are always useful. The real questions are how useful, how important, and how effective, in comparison with alternative ways of achieving the same Basic National Security objectives within the total amount of resources available?

(2) There are capital expenditure decisions to be made in connection with these forces.

(3) There are questions relating to activity rates and deployments. What activity and deployment factors affect the cost and effectiveness of the force? How do cost and effectiveness vary with, e.g., flying hours, maintenance schedules, exercises, alert status, crew ratios or manning levels, etc. Which if any should be changed? Why? Can costs be reduced without commensurate reduction in effectiveness by variation in activity levels?

(4) There are questions about management. Are our major forces organized efficiently? Do the supporting forces and activities bear an appropriate relationship to the combatant forces? Are the tables of organization right? Are the bases and installations in balance with the forces they support? Is the logistic guidance appropriate to our objectives?

R&D Decisions

Then there are special questions relating to research and development decisions. Here we want to examine each major weapon system program, as well as the basic and applied research program. In the case of weapon system developments, we want to know how effectively the system could contribute to which military objectives, the total development cost (in whatever appropriation account), and the future capital and operating costs if a decision were made to procure it.

In addition to general guidance on the supporting studies and analyses, there will be a more detailed list of questions and requirement studies associated with each program package review. This list will supplement the Secretary's list of 121 projects and include many items on it.

As program decisions are made, we

will need some sort of bench-mark to tell us where the decisions are leading us in terms of a total budget. We plan to use two controls. The first is the 1962 budget. For the second, we intend to ask the Services to cost out, in expenditures and NOA terms, the force structure submitted by the JCS in answer to Mr. McNamara's Project No. 3, that is the forces provided in the President's budget for FY 1962. Initially, these forces will not have to be costed out in program package terms. But during the summer, as force proposals are submitted to the Secretary, he will want to see the program package cost implications of the alternative of continuing each force as projected. The assumptions for this exercise will be issued shortly.

Reliance on Services

For each program package, therefore, and where feasible and appropriate for program elements within the package, we will want the following cost information (obligational authority and expenditures; also numbers as well as cost of military personnel):

(1) How much in 1962 budget?

(2) How much implied in the specified benchmark force structure, 1963-65?

(3) What alternative programs (forces, capital expenditures, etc.) do you propose, and how much will they cost—for the next five years? (Or more in a few cases, where appropriate.)

In general, we shall be relying on the Services to design and present imaginative proposals both for "add-ons" and reductions responsive to the general policy guidance provided by BNSP. But the Secretary will also be interested in seeing other alternatives. These will be specified in the program guidance for each program package.

Finally, we shall issue a schedule for program submittals so that the Secretary and his advisors can examine and make decisions on program proposals in an orderly way over a period of several months.

The "Big Board"

As the program packages are reviewed, the Office of Programming will advise the Secretary on the resource implications of some of the alternatives submitted. A special program cost analysis group is being established in my office to review program element cost submissions by the Services. The Secretary will examine the program submittal and make tentative program decisions to be used in preparing the FY 1963 budget.

As program packages are approved and program decisions made during the deliberation process, a "Big Board" in the Office of Programming will be maintained on a current day-to-day basis. After all program decisions concerning the FY 1963 budget have been made, the "Big Board" will reflect the total Defense structure in program package terms. As changes, deletions, additions or any other deviations from the original total of packages take place, the Board will be so revised.

In costing end-product programs, I have said that we want the *full* budgetary implications included. But we also realize that we have to do what is feasible and practical this year, and that this will have to be done using statistical factors in most cases. The question is how far and deep should one go into the support structure, for example, in tracing the cost implications. The general rules are:

(1) Try to prorate (take "slices") if the overhead or support activity varies directly with the force unit or weapon system (e.g., specialized training, spares, maintenance): but if the overhead or support activity doesn't vary, don't prorate it (e.g., academies, colleges, higher headquarters).

(2) Be very explicit about what is and isn't included. We realize that some support elements that ought really to be prorated will not be able to be this year. However, we intend to pursue this and do a better job next year.

October Deadline

I do want to emphasize that while statistical cost factors will be acceptable for program decision-making purposes, we do not intend to forget about the cost estimates used for program decision-making purposes when we reach the budgeting phase. Substantial discrepancies will be called to the attention of the Secretary and may necessitate revision of the program decisions.

This is an ambitious program. However, one of the things that gives one some confidence that we can manage a program review along these lines is that the Weapon Fact Sheets for FY 1962, which include only 145 weapons and items of equipment, account for about 75% of the procurement appropriations, and about 45% of the RDT&E and the construction appropriations. Of course, as we all know, the difficult areas for this approach, are operation and maintenance, and military personnel.

We expect to complete the programming phase not later than October 1, 1961. The tentatively approved program packages will then form the basis for budget submissions in the usual fashion by appropriations. The total budget will then be reviewed and recommendations made to the President by early December.

I want to emphasize that the program package concept for review and decision-making as directed toward the FY 1963 budget is only the beginning of the formulation of a continuing planning and programming/financial management process.

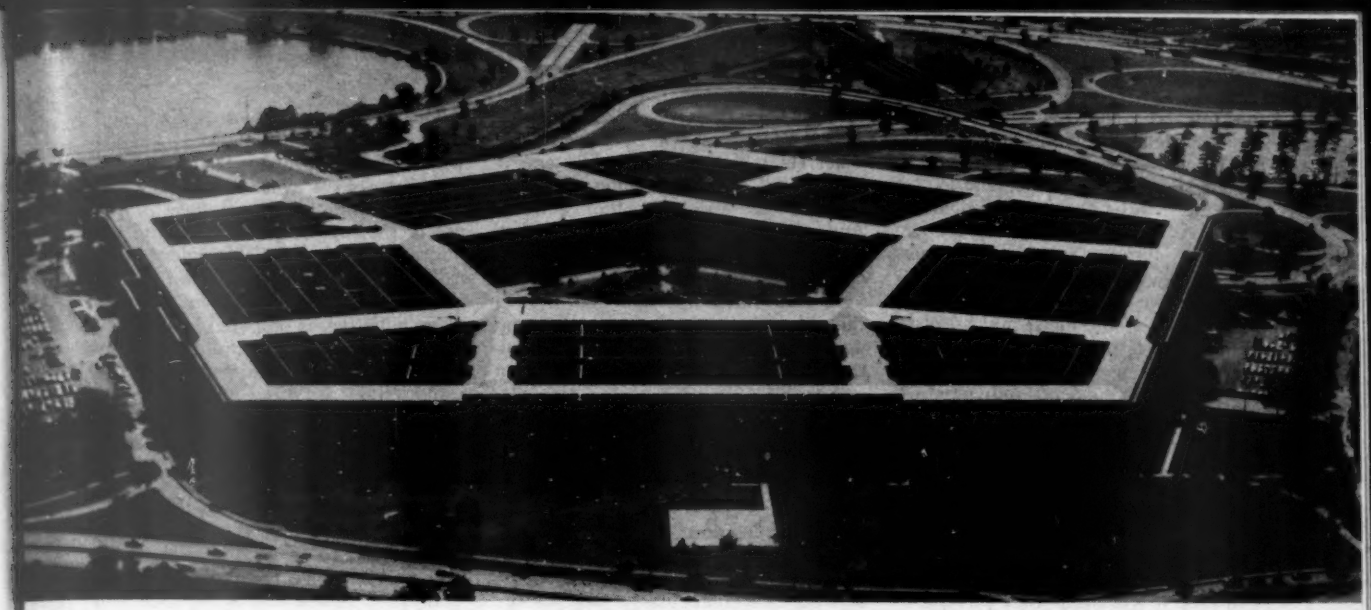
We visualize a continuous process of review and revision to improve the system. Toward the longer term objectives of an integrated programming and budgetary system, the Office of Programming with the assistance of contractor personnel and consultants, will begin to test the adequacy of presently existing information systems by estimating the cost of some of the more difficult resource elements such as construction, operation and maintenance, personnel and training associated with the FY 1963 program packages. Broadly, the sequence and nature of this phase of activity will be along these lines.

First, we will study and define types of information, both financial and non-financial, necessary for making the top management program decisions. Then against these requirements, and with the assistance of knowledge gained in connection with the FY 1963 package work, information presently available at the OSD level will be thoroughly surveyed.

In parallel with the data survey, the Programming Office will try to design a system for clear and concise display of program package information for the Secretary of Defense and his staff on a continuing basis. Following these steps, all military department information systems will be reviewed in order to determine the extent to which information is available or can be reoriented toward meeting the requirements of management decision information. Where the requisite information is determined to be unavailable, study will be generated in order to recommend means of acquiring it. We anticipate that this activity will continue until approximately 1 December of this year.

Future Improvements

Based on the FY 1963 program package work and the Programming Office/military departments/contractor study results, improvements will be initiated on the program packaging concept and the data systems for continued programming/financial management purposes. We will try to guide this activity from December 1 of this year forward so as to make significant improvements in the concepts and systems that I have been discussing in time to accommodate FY 1964 program guidelines. ■



Re-organization or Re-orientation?

Re-organization isn't always the solution to sound management. One of the basics, however, is a workable organization chart—one of the tools for systematically generating productive action. Here are some of the reasons why re-orientation is almost always a better solution to enterprise Organizational problems, and some implementing rules for managers to use . . .

by Alfred N. Bloch
Office of the Chief Engineer
U.S. Army Chemical Corps Engineering Command

ANY ENTERPRISE, whether business or governmental, is intended to serve a definite purpose, to achieve certain objectives. It is the association of a group of men, expected to cooperate and work toward desired ends.

In order to operate efficiently, such efforts must be properly "organized." Enterprise activities must be broken down into clearly defined areas of endeavor and their inter-dependencies. A carefully prepared Organization Chart is therefore the basis of operation of an enterprise.

The organization chart also conveys valuable information on personnel and the type needed in each sub-division, and for each particular activity. In a new enterprise, the organization chart serves as a guide for the selection of a qualified man for each specific job.

In a new enterprise, the organization chart is developed first, and personnel can be chosen to fit that chart.

In an existing enterprise, it is used to advantage for the filling of vacant positions.

It goes without saying that any organization chart is subject to changes. Re-organization might become necessary, for example, when experience teaches that the re-distribution of responsibilities will improve the efficiency of operations, or when the enterprise expands or alters its objectives.

Changes in management concepts (particularly after a new "boss" has taken over the reins) lead also very often to revisions of an organization chart. Such re-organization is a very delicate and difficult undertaking. The streamlining of operations may be its main objective, but **in an existing enterprise, available talent has to be counted with first, and the organization chart must be geared to the most advantageous use of human resources on hand.**

At its best, any sensible re-organization is therefore a compromise between academic organization concepts and personnel considerations.

If management is dissatisfied with the business conduct of an enterprise, if thoughts are given to promotion of more efficient operations, re-organization is not necessarily the answer:

Mobilization of the creative genius within the ranks and its consistent stimulation might be the more natural approach and might yield the better results.

The organization chart is nothing but a cold and inanimate structure. It is given life and meaning by the people who man the posts and perform the intended tasks. The spirit of their approach and the quality of their performance determine the standing of the enterprise.

The organization chart is one of the tools for systematically generating productive action. Progress and the successful conduct of business is a matter of individual effort.

A second management responsibility is development of routines and procedures for efficient conduct of the business activities. They prescribe the mechanics of operations and transactions, and if cleverly designed and carefully applied, are very useful. However, if not properly controlled, they can become extremely dangerous and annoying. All too often, they lead to unnecessary red tape, develop into a purpose of their own and are a temptation to the routine-men within the ranks to waste their time with purely bureaucratic "achievements."

If a report is being questioned, because its paragraphs are not numbered according to the "book," or because it includes a paragraph which does not appear in the "suggested" outline for this type of report, such actions can be very discouraging. And if countless concurrences are required before any official decision can be made, one may very well be tempted to evade the issue and resort to inaction.

Thus, management is confronted with a major problem: preservation of

the initiative and dedication of the creative elements within the ranks in the face of organizational necessity.

The standing or the reputation of any enterprise is based on its achievements. An enterprise acquires renown through: efficiency of its operations; the quality of its output; the ingenuity and inventive genius reflected in novel, unconventional products; and an elaborate research program, which generates and screens new ideas, translates promising new concepts into practice, opens new horizons, and widens our scientific knowledge and engineering skills.

If the enterprise succeeds, in addition, to out-distance the competition, management and the stockholders will be delighted, indeed. Out-distancing the competition is even more important —in fact, it will decide our survival in the military area.

Leaders Aspire

Leaders of any enterprise aspire after those goals. They are therefore very much concerned to surround themselves with competent and dedicated employees. Professional men within the ranks are the backbone of any enterprise. They are chosen on the basis of their education and experience. Imagination, creative ability, and the urge for their expression are additional essential qualifications which cannot be readily recognized. In many cases, they are dormant and have never been challenged.

It should be remembered:

All activities of an enterprise are but men and machines in action. Imagination, however, is the engineer of the better products of tomorrow.

Another major management responsibility is to create that wholesome internal climate that cultivates individual initiative and the display of resourcefulness, generates a healthy competitive spirit, and promotes concerted teamwork of pronounced individualists. Under such conditions, even ordinary men can be stimulated to extraordinary performances.

As a rule, thinkers are individualists. Many of them are active and aggressive, and administering them, harnessing their over-flowing energy to serve useful purposes is a difficult task which requires mature judgment and patience. They flood you with ideas and suggestions you cannot afford to ignore. They step on other people's toes and create trouble inside and outside your immediate area of responsibility. Thus, they might even get you into trouble.

The protagonist of new ideas is always a very unpopular contemporary. He jeopardizes the continued application of conventional thinking and accepted routines. If one of his ideas is translated into practice, the rank and file will have to do things differently—thus the idea man will be given a hard time. He will turn into public enemy No. One if the introduction of a new idea of his affects another activity. And all too often management then withdraws its support—to evade throat-cutting and internal conflicts—and the idea man turns into the bad boy of the story. Instead of recognition and appreciation for constructive contributions, frustration and discouragement are his lot.

Confirm Convictions

Incidents of this nature please bureaucrats and the routine-men within the ranks. They confirm their conviction that "conformity" to the established mass pattern and "inconspicuousness" pave the road to job security, and for that they gladly sacrifice accomplishments as a goal.

A strong body of opinion is being noted everywhere that the conformist is the boy who gets ahead. And let's not deceive ourselves, more men make their way to the upper levels by being "good boys," by pursuing conventional established approaches than by revolting against them and attempting to improve them in the light of our advancing knowledge and experience. Thus, conformity appears as an alluring type of behavior, as the attitude that follows the course of least resistance and carries an immediate, much coveted reward: A comfortable sense of ease and the security afforded by "keeping out of trouble."

Where conformity is being accepted or even encouraged, a lot of talent goes into hiding, and is being wasted.

For a leader, it takes courage to declare war on conformity. Conformity to established thinking and procedure is considered the backbone of a smooth running operation. Under such conditions, decision making is routine.

No Problems

Management will not be confronted with any serious personnel, administrative and technical problems. The output will be satisfactory, though conventional, and leaders will make a very good showing. If a good showing determines their performance rating—all too often it does—they would be fools if they engaged in experiments and risked their reputation.

Of course, the term "conformity" covers a wide territory, and we are certainly not opposed to everything it stands for. Conformity of behavior—good manners—for example, is a very desirable attitude. Conformity of thought, on the other hand, may be re-assuring to individuals. As the doctrine of an enterprise, however, it spells stagnation and the descent to mediocrity.

Dynamic management realizes and takes action against such danger. It will therefore generate and promote that atmosphere which encourages creative thinking, and it will make proper use of the resourcefulness and the imagination of the available talent. This calls for inspiring leadership which shows appreciation for a man who displays initiative, is prepared to take calculated risks, to make professional decisions on his own and to assume full responsibility for his course of action.

It calls also for a flexible organization chart and the use of each man in his highest capacity. Yes-men will then lose their privileged status. Instead, due credit will be given to those who have the courage of their conviction, advance constructive criticism, and are prepared to prove their point.

In such environment, routines will be sacrosanct only as far as they are instrumental to the speedy achievement of objectives and to the widening of our knowledge. Cutting corners for the streamlining of operations will be the law of the land, even if it distresses the routine man. Honest mistakes in action will be readily excused, but no mercy will be shown against failures by inaction.

The Wrap-up

Last, but not least, dynamic management will expect the professional men within its ranks to take an interest in company operations as a whole. A scientist or engineer is, of course, primarily concerned with his own projects. But if he has caliber, he does not isolate himself. He will maintain contact with his co-workers and keep informed on their activities and, in particular, their problems.

Anybody's professional problems should become everybody's problems.

A seasoned expert in any particular area welcomes constructive suggestions. He knows that inspiration cannot be monopolized. Even today, in this era of specialization, that spark of geniality which solves a problem or opens new horizons can be kindled in the most inconspicuous places.

Dynamic management will generate this spirit of mutual cooperation. It will thus mobilize and pool the inventive genius within the ranks, and the resulting teamwork will be unbeatable.

If such spirit governs an enterprise, smooth operations may not be maintained at all times, but the brains will become active, the brains will dominate the activities and thus rule the destinies of the enterprise—and the conformists will quit or reform. It is the spirit that spells progress and success.

Just another re-organization won't do it. Why not consider a re-orientation of the minds instead? ■

ABMA Managers Find That . . .

It Always Pays to Save Money

At the Army Ballistic Missile Agency, there is a cost-consciousness campaign underway, headed by a money-minded mascot "Scotty McMissile." Here are some of the problem areas, the solutions found for these, as well as some pointers on how to save within your own command. . . .

Lt. Col. Lee James, USA

IF the Army is to field reliable missile systems it must have weapons that from their inception have suffered no sacrifices in the development of even a single item among their thousands of components.

But the Army budget has been limited. If there must be no sacrifice of quality or performance, where can savings safely be made?

The new Research and Development Operations Division of the Army Ballistic Missile Agency, which assumed responsibility for development of ten of the Army's ballistic missile weapon systems July 1, 1960, already has found the answer:

Savings must begin with the first concept of the weapon system. It is during the research and development phases that the system is designed, altered, redesigned, and painstakingly brought either to fruition or to failure. It is also during research and development that savings must start.

The Poster Mascot

As the keystone of the savings program, the Research and Development Operations Division determined that value analysis consciousness must be instilled in every employee. Recognizing that there is no substitute for a graphic communication of an idea, a mascot was adopted whose time was to be devoted to saving missile dollars.

The mascot is Scotty McMissile, a tightfisted, shrewd-trading character who was introduced by poster throughout the entire Army Ordnance Missile Command. He *is* making the missile people think about saving money. But he has had his troubles—and most of them were in the research and development area.

There are three readily apparent contradictions to savings in this phase of a missile system's life. In the R&D stage the advantage of mass-production, low-cost-per-unit is not possible. Rather, the small quantities usually produced in this stage—in accordance with one of the foremost laws of economics—necessarily cost more per item than denser-volume items.

Second, costly production tooling normally must be developed during the R&D period.

The third problem in R&D is the complexity of missile systems. They are growing daily more intricate and running costs higher.

Any engineer who was in the industry ten or twelve years ago can recall that a money problem then existed in this missile business. In 1949, an Orlando, Fla., paper carried a small article outlined in obituary black. It said, "The United States is spending more money to subsidize the peanut crops than it is spending on guided missiles." That was the nature of the money problem then.

Since that time the amount of money in missiles has been multiplied by millions. Then why a money problem? No basic change in the proportionate amount of hardware and engineering in missile systems occurred in these ten years. What, then, are the differences?

They are more apparent than one realizes: The "Crash Program" approach that has been inherent in missile programs since those early days has contributed the single most significant excuse for the shortage of value for the dollar. Hasty design and extra money required for compression of time and development are only a couple of the factors that pushed up costs in the crash program era. Inflexibility and its corresponding overhead has certainly followed as a cost raiser in even more intensified fashion since crash programs began.

In short, hasty design, inflation, hardware and engineering costs, growing overhead, and lack of value analysis have been the causes for the disproportionate amount of hardware received for the huge expenditures today. Most of these problems can be understood readily, with the exception of lack of value analysis.

The inflexibility inherent in a missile program is, of course, one of the greater deterrents to value analysis thinking. Missile programs by their inflexible pattern naturally fostered higher and higher costs.

In the stereotyped pattern of the telescoped development concept, the prototype is introduced in the R&D period. Production begins then with the prototype. Changes to save money, therefore, are very difficult to introduce at any point in the compressed schedule, once the program has begun. No one had decided to include money-saving as an engineering factor at the time of the original concept or during the early design stages.

Whether we continue with the telescoped development of the crash era, or whether we stretch out to a more orderly phased pattern, there can be no question about the time to figure costs-savings. It is immediately at the beginning of the research and development cycle.

Through the Mill

"Quite so," the average engineer will say, "so we do that. We introduce this thinking at the beginning. We simply put another man into the scheme, a Value Analysis Engineer. He'll get in and work with the design people from the beginning."

This would seem to be a simple solution to a simple problem. But check again. The problem is compounded by something far more inflexible, far more unpredictable, than the given cost of a given piece of hardware. This element is human nature!

Many of the key missile engineers in Government and in industry have now been in more than one development system. They have been through the mill several times. If you don't believe it, ask them.

When the design centers on selection of a propellant valve, a servomotor for an actuator, or a bearing for a turbo-pump, they will tell you quickly which one will do it. They have seen it work in that last system they worked on.

Even if it is a little overdesigned for this system, it will work. The engineer knows it will work, for it worked before. After all he *is* a design engineer and his job *is* to make the product work, and that *is* a big job.

This is not meant to imply that the design engineer's job is not a big one. The task of the design engineer is one of the toughest in the missile business.

This may well be a point, too, for management and operating personnel to consider. They must have a sympathetic understanding with the design engineer. This is essential, if they want to instill in him the notion of value comparison. The aim is to insure that he considers value along with the rest of his design criteria in attaining his goal.

Padding the Margin

There is a good reason why the engineer thinks the way he does; why he will choose a product of what he considers exceptionally superior design, regardless of cost; why he will choose a product that utilizes advanced circuitry or a metal of rare physical properties, regardless of cost. The reason: He must have performance—reliable, unquestionable performance.

It is therefore necessary at ABMA, as it must be in all management, to stamp one fact indelibly on his mind. It is the fact that this performance that is so mandatory may not be as tough an assignment today for that particular job as it formerly was. For one thing there are now many components available, and some with a lower cost *may* work quite well.

It boils down to a simple illustration. If Scotty McMissile had only one small pile of debris to clean up, *he* would use the economical broom, but the design engineer would pick the more expensive vacuum cleaner because of its superior performance.

The broom in this instance will do the job as well as the vacuum cleaner. In fact, the vacuum cleaner is basically designed for a much bigger job. Despite this, the engineer's view of the demands for performance sometimes blinds him to the simple and economical method of achieving that performance. He tends to overestimate the needs.

Consequently he pads his safety and reliability margin (or thinks that he is doing so) by selecting the more expensive way. In defense of the R&D engineer, pressure to maintain development schedules while maintaining performance is a major contributing factor that causes him to overestimate performance demands.

User requirements are tough requirements, and they should be. Certainly we would not ask the user to stop pushing the state-of-the-art and simply accept yesterday's weapons. If he did, the R&D people, true to human nature, would probably be satisfied with what works and settle for "tried-and-true." There may be no surer or faster way for our country to become a second-rate nation than with obsolete weapons.

When the user formulates his demands, ABMA feels it is the R&D engineer's responsibility to ask the user to think value analysis, to weigh the relative value versus cost of the various requirements imposed.

Does the user want smaller and lighter components, improved mobility, reduced reaction time, minimum ground support equipment, minimum pre-launch calculations, minimum launch-type checkouts, improved missile-laying techniques, multiple target capability? Meeting all or part of these is a tough assignment for the design engineer.

Couple these with the user's demand for more reliability, improved mean-time-to-failure ratio, and improved guidance accuracy, and the problem is again compounded.

Is it any wonder that the engineer faced with these, and left to his own devices, will do his best to guarantee them without consideration of cost? And inevitably higher spiraling cost has been the history to date in our missile program.

Positive Measures

At ABMA, the user is asked not to reduce his tough demands, but to add one to them—lower costs. To do this, he must think value analysis. He must weigh and balance value-for-dollar. He must insist that the engineer do the same. The user must recognize the need for value analysis but ABMA does not attempt to saddle him with all the value analysis job. R&D accepts the prime responsibility for it.

In fact, ABMA has proceeded with a number of positive measures to install value analysis as an integral and permanent part of research and development. One man is assigned division-level responsibility for coordinating value analysis efforts. Responsible personnel have been appointed in every segment of Research and Development Operations to assume a value analysis function in addition to their regular duties. Each of these people is being schooled in value analysis philosophy.

ABMA is inserting in contracts of prime R&D contractors a value analysis clause. ABMA emphasizes that advance design engineers also are value analysis engineers. The agency insists that the "Crash" must be taken out of the programs where possible.

To achieve this, R&D Operations has included an organizational element called Analysis and Advanced Design Laboratory where personnel are continually thinking ahead. They consider possibilities for proposed and pending missile systems: probable design, best approaches, best major components. Thus when a missile requirement is levied on ABMA, they are ready to begin at the beginning to blend the value analysis approach into the R&D effort.

The Four Elements

In addition to the organizational arrangement for encouraging extra-value-for-each-dollar philosophy, there is also an active R&D management approach in the effort. At one industrial conference after another these days it is stressed and urged that management take a "second look" at the programs to save money.

In ABMA's R&D Operations the approach is predicated on "taking that second look *first*." This modification to the "second look" philosophy is essential in every industrial and government organization involved in the missile industry. For this philosophy to prevail, everyone from the company president to the janitor has to "think" value analysis.

Hence, at ABMA, as well as among its contractors, there is a campaign to instill three elements in mind. The first of these is an awareness of the cost problem. The second is an attitude receptive to doing something about stretching inadequate funds to do the job. The third is a realization that it is necessary, *now*, to save money that can then be applied elsewhere. It can be used to buy the system qualities and capabilities that might have been sacrificed because of fund shortages.

The fourth and toughest idea to implant is a firm conviction that savings are possible in every single missile program. If this succeeds, then the fifth element of the value analysis habit will logically follow. There will be a willingness to try.

Now what about results? Yes, ABMA has had and now is having desirable results. ABMA is saving money. These results can best be illustrated by two specific benefits that have accrued from value analysis engineering:

(Continued on page 50)

NATO Forecast

France Doesn't Mean It?

France's well-touted "go it alone" attitude toward nuclear developments and a host of other things in its relationship to NATO (while encouraging everybody else to go it together) is being viewed by some thinking Europeans as "hopefully a transient thing." Said one, "whether they are even thinking about it consciously or not, I really believe, when this thing finally resolves itself, that the French attitude will be viewed as nothing more than a very clever technique for convincing the U.S., which is doing the same thing, that such a go-it-alone policy is a bad idea."

What's Ahead For Blue Water

British armed forces are quietly, and sometimes not so quietly, touting Blue Water as a replacement to the Sergeant missile for NATO. Argument: weapon system *does* appear to be much less complex. (Reportedly, U.S. Army ran an evaluation on it, said in its report that Blue Water was "better than anything we've got or can produce in the near future.")

Prospects for Blue Water's acceptance—dim, according to cynics (who are probably right based on past U.S. performance). One factor which may save it: U.S. industry has a stake in the system too. Guidance is a Minneapolis-Honeywell development.

NATO's New Super-Salesmen

For an American in Europe to broach some part of the subject of who should provide what part of the armaments NATO buys is, to our European allies, like stomping on a highly infected boil with both feet. Part of the situation which bothers even U.S. officials in Europe is that U.S. government offices are being used to carry on what has been termed a "tremendous pressure campaign" to get the NATO allies (particularly the Germans) to "buy American" armaments.

Picture has gotten so dark that Europeans (and this will come as quite a shock to some of the Military Assistance Program people) have taken to labeling the Military Assistance Advisory Groups, with one or two exceptions, "nothing but super-salesmen for U.S. industry." The European argument: "we must strive for independence. Until we make this our goal, each nation will continue to go its own way. America is in the best position to see that interdependence becomes a reality. Unfortunately, instead of doing just that, 'you have acquired a European reputation for constantly saying sell America—to hell with the rest.' "

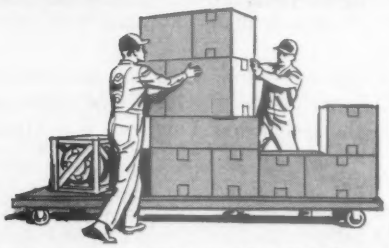
British Face Roadblock

British aircraft industry, in trying to play a larger "supplier-of-armaments" role to NATO, faces a big roadblock: the inability to crank up some version of the U.S. Air Force's concurrency concept. Thus: U.S. can put missiles, for instance, in silos in four years. It takes the British seven.

Reason has little to do with frailties (real or imagined) of the aircraft industry itself. (Only spot they can't stack up to U.S. is in large production capability—which in modern military times is becoming less and less important.)

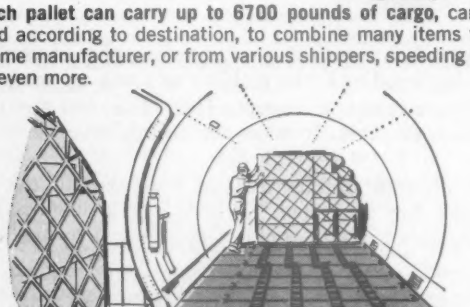
Problem is twofold: (1) European industry must often go clear to prototype before government will come in with financial backing, meaning a heavier initial company gamble ruling out many big weapons developments of which, technically, they are capable; **(2)** In spite of Infrastructure help, NATO doesn't really buy as a *NATO* organization, which logically it should to take full advantage of the growing European industrial base.

PAN AM ADDS AIRPAK CARGO HANDLING SYSTEM to THE WORLD-WIDE MARKETING SERVICE



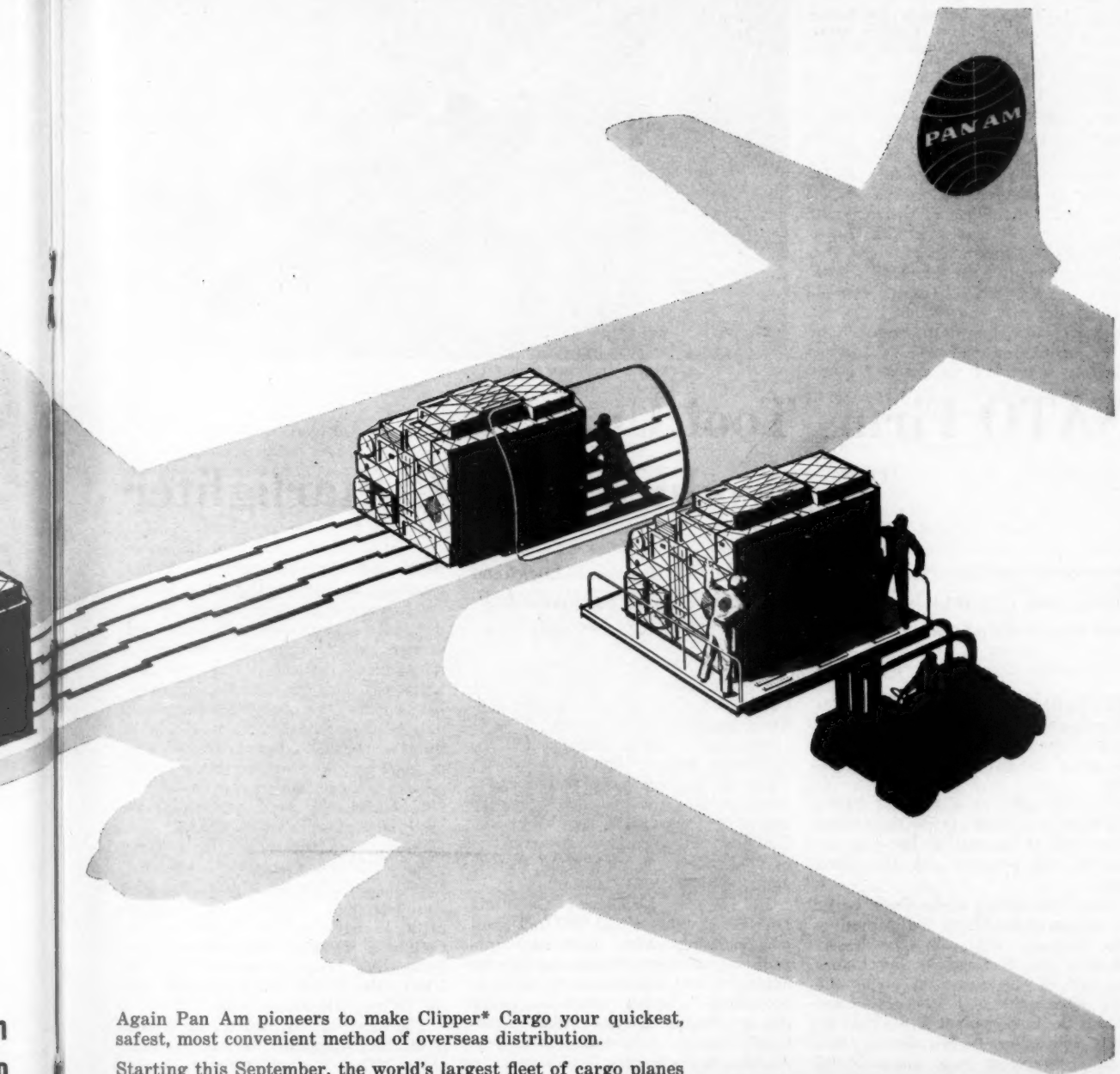
1. Shipments are "unitized" on standard 88" x 108" pallets. These pallets are the same size as pallets specified by MATS (Military Air Transport Service) and are compatible with over-the-road transport facilities.

2. Each pallet can carry up to 6700 pounds of cargo, can be packed according to destination, to combine many items from the same manufacturer, or from various shippers, speeding handling even more.



3. Plane completely loaded in 45 minutes. Until now it took hours! And no winches, cables or complex mechanisms to jam up or break down. 2 men roll the load in fast. Load locks in position, and that's it!

Remarkable new palletizing system divides a whole planeload of cargo into just seven fast-loading, individually protected units. Means safer, surer, faster-than-ever deliveries—world-wide! Loading and unloading time is cut more than half.



Again Pan Am pioneers to make Clipper* Cargo your quickest, safest, most convenient method of overseas distribution.

Starting this September, the world's largest fleet of cargo planes equipped for mechanized loading will be at your service world-wide.

With startling cuts in ground time at both gateway and destination, your shipment will now get to consignees even faster than before. What's more, Pan Am's AIRPAK system means less handling, less chance of loss, a *more thoroughly efficient* system of shipping from the moment your shipment leaves the loading platform. And, of course, this system also allows for unusually shaped products.

This is just one more example of Pan Am's constant effort to help you do business abroad with greater ease, efficiency, economy. Why settle for less when, at no extra cost, you can get all these unique benefits of The Pan Am World-Wide Marketing Service – world's greatest source of Information, Transportation, Representation abroad.

Call your cargo agent, freight forwarder or Pan Am office today.

PAN AM PUTS YOU IN BUSINESS ABROAD – WITH ONE PHONE CALL

*Trade Mark, Reg. U. S. Pat. Off.

German Luftwaffe Starfighter of the type (F-104G) being built in Europe.

NATO Firms Tool Up To Produce F-104G Starfighter

Over 800 Starfighters will be built under the European-Lockheed Production Program by early 1964, with the first European-built model to roll off the assembly line in Germany later this year.

by Anthony Vandyk

IN TERMS OF MONEY, numbers and, above all, international cooperation, there has never been anything like the F-104 program in aviation history.

By early 1964 at least 800 F-104Gs will have been built outside the United States and at the end of that year the number will be well over the 1,000 mark.

The first aircraft to be built under the European-Lockheed F-104 production program will roll off Messerschmitt's line in Germany just before the end of this year. At about the same time another F-104 production line, at the Fokker plant in the Netherlands, will deliver its first aircraft. And shortly thereafter two more F-104 production lines, at the Sabca plant in Belgium and at Fiat in Italy, will start rolling.

Although the European production programs have not yet gotten under way, F-104s are already in service in Europe with the Air Force of the nation that is Lockheed's biggest customer for the fighter—Germany. These are 30 two-place F-104Fs built at Lockheed's California Division for the German government.

The first F-104G, the combat version of the Starfighter for the Luftwaffe, made its initial flight last October. A total of 96 aircraft are being produced for Germany at Lockheed's factories in Burbank and Palmdale, California for use prior to the availability of European-built aircraft.

Meanwhile, in preparation for the European license program, Lockheed's California Division has already shipped large quantities of material to Europe and already trained several hundred Europeans involved in the program, including pilots, manufacturing experts and technicians.

In Europe, Lockheed's California Division now has about 100 tool planners, administrators, electronics specialists, space parts provisioning experts, engineers and manufacturing advisors providing technical assistance under the supervision of John Pitkin, Lockheed's Director of European F-104 Production. Pitkin has his headquarters in Coblenz, a town in Germany from where the four-nation production programs are managed.

Details of the management set-up will be described in a subsequent article in ARMED FORCES MANAGEMENT. At the moment plans are being implemented to make the management authority, the Office of Direction and Control (ODC), into a NATO agency. ODC, staffed by high European government employees and working closely in liaison with Lockheed, has the following responsibility: (1) logistics and production control; (2) engines; (3) electronics; (4) contracts; (5) planning and coordination. ODC is responsible for determining which companies should participate in the F-104 programs in Europe. Its aim is to enroll manufacturers who can make the required components as efficiently and as economically as possible with minimum plant expansion and can also follow up with the provision of overhaul facilities. Duplication is permitted only where without there would be a time or economic penalty. ODC can perhaps best be described as the F-104 weapon system management group.

Committed to spend over $1 billion of F-104's purchase from U.S. and European production programs, Germany is Lockheed's biggest F-104 customer. The Luftwaffe is procuring 604 European-built F-104Gs in addition to 30 F-104Fs and 96 F-104Gs from California Division production. The Italian Air Force is getting 125 F-104Gs, the Dutch Air Force 120 and the Belgian Air Force 100.

The first of the European F-104 production programs involves the Sud Group. This is an all-German group comprising Messerschmitt, Heinkel, Dornier and Siebel. Messerschmitt will handle assembly. Under the present program the Sud Group is to build 210 F-104Gs at a rate that will build up to six aircraft a month. The Sud-built F-104G is scheduled to be completed in the last quarter of this year. All 210 aircraft scheduled for production by the Sud Group will be delivered to the Luftwaffe.

The second European F-104 production program will be undertaken by the Nord Group and will involve a larger quantity of aircraft and a higher rate of production than the other programs. The prime contractor in charge of assembly is Fokker, with

another Dutch company, Aviolanda, and three German manufacturers (Hamburger Flugzeugbau, Weser and Focke-Wulf) forming the group. Present contracts call for the Nord Group to produce 375 F-104Gs starting in February 1962. Indications are that the production rate will build up to 14 aircraft a month. Of the 375 F-104Gs, 255 will be for the Luftwaffe and 120 for the Dutch Air Force.

Fokker in Amsterdam will manufacture the rear fuselage, wing and the empennage. It will also be responsible for final assembly and flight testing of the Nord Group's F-104Gs. Aviolanda will take care of fuselage assembly using components built in Germany by Focke Wulf (air scoop), Weser (center fuselage) and Hamburger (front fuselage).

The West Group comprises two Belgian companies—Fairey and Sabca—with the latter acting as prime contractor and handling assembly. The first of the 182 aircraft contracted to be built by the West Group will be completed in 1962. The Belgian Air Force will take 100 of the West Group's initial production with the remaining 82 going to the Luftwaffe. It is likely that the West Group's output will build up to six aircraft a month.

Details of the Italian program are not yet fully available but Fiat will be a prime contractor and will be assisted by other members of the Italian aircraft industry. There will be cooperation between the West Group and the Italian Group. The Italian program involves the production of 182 F-104Gs, 125 of which will go to the Italian Air Force and 57 to the Luftwaffe.

The General Electric J79 engines for the European-produced F-104Gs are being built by BMW-Triebwerkbau in Germany, FN in Belgium and Fiat and Alfa Romeo in Italy. The four engine manufacturers will work in cooperation and will each build different components. The first 40 J79s for the European-built F-104Gs will be supplied by General Electric in the form of "Do-it-yourself" kits in the same way that Lockheed is supplying the airframe manufacturers with knocked-down parts for 35 early license-built aircraft.

BMW-Triebwerkbau has already assembled the first five J79s for the European F-104 program. The first engine should be shipped to Messerschmitt later this month. Parts from German production and German subcontractors will be fed into the production line reaching a 100% share in the middle of 1962. BMW-Triebwerkbau has subcontracted to its parent company BMW AG for about 50% of the total German contribution to the European J79 program. The German part of the J79 production represents a 40% share in the total order. Fabrique Nationale of Belgium will produce the "hot parts" of the engine representing a share of about 40%. Fiat and Alfa Romeo will provide the vanes (15% contribution) while the fuel control system (Woodward) will be bought in the U.S. The majority of engines will be assembled at Munich-Allach. All countries—Belgium, Germany, Italy—are to build test cells in connection with the overhaul of engines.

Canada is building 200 Starfighters (CF-104) for duty in Europe.

The European program calls for ultimate production in Europe of almost every component of the F-104G. Only big forgings and sophisticated electronic items will probably come from the U.S. However, ultimately it is hoped that European production sources will be used for all electronics equipment in the F-104G. Present indications are that all through 1961 most of the electronics items will come from the U.S. and in 1963, European sources will only be in a position to supply about half of the total number of items required.

The following are the European electronics companies which are slated to build the various items for the F-104G: NASARR Radar: Telefunken (Germany), Philips (Netherlands) and MBLE (Belgium). VHF: Van der Heem (Netherlands). TACAN: Lorenz (Germany). Optical Sight: AEG (Germany) and OIP (Belgium). Infra-Red Sight: ELTRO (Germany) and Oude Delft (Netherlands). Position Homing Indicator: Teldix (Germany) and Philips (Netherlands). Air Data Computer: Inter Aero (Germany) and Bell (Belgium). Bombing Computer: Philips (Netherlands). Inertial Navigator: Litton (Germany), Monroe (Netherlands) and Bell (Belgium). Automatic Pilot: Minneapolis Honeywell (Germany) and ACEC (Belgium).

It is in its electronic features that the F-104G differs particularly from the versions of the F-104 ordered by the U.S. Air Force. For the USAF the F-104 is an air superiority weapon whereas for European military requirements it needs to perform as an all-weather interceptor, fighter-bomber or reconnaissance aircraft.

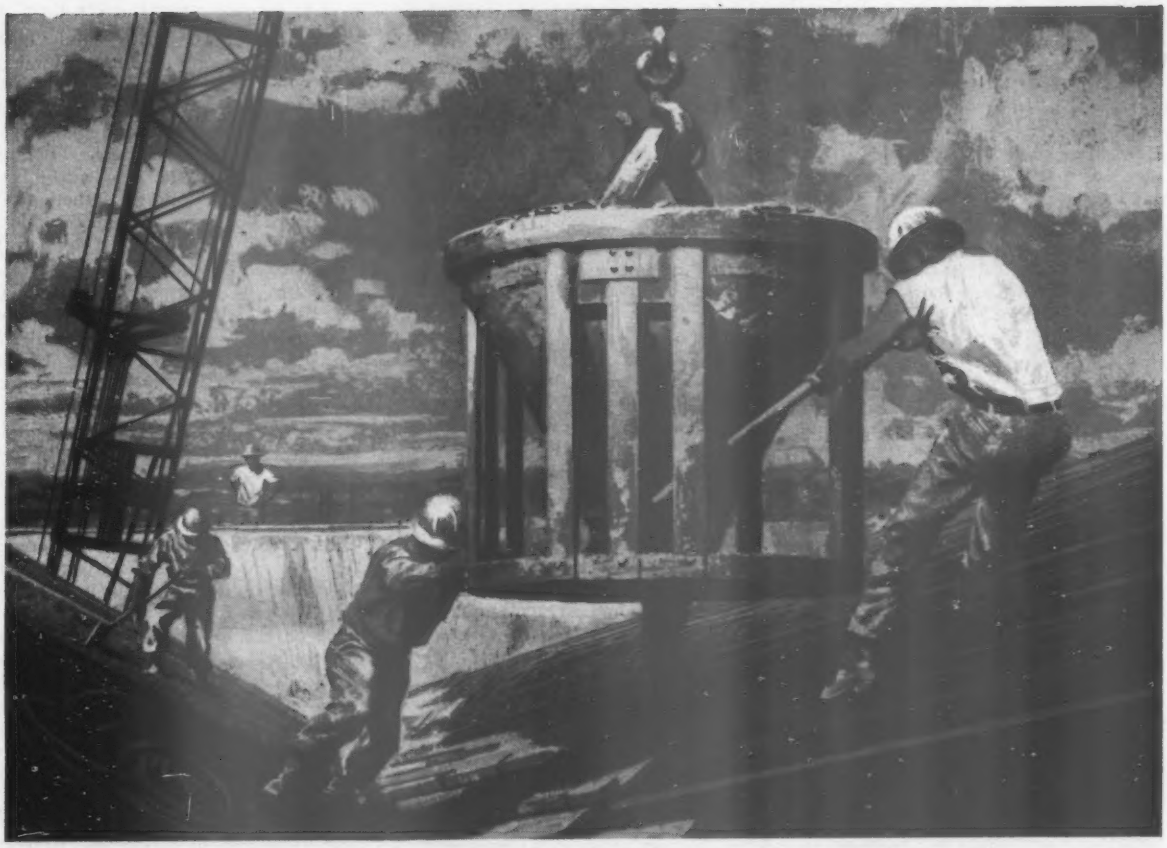
Japan's Program

Essentially similar to the European F-104Gs are the 200 CF-104s which are being built in Canada for use by the RCAF in Europe. The first CF-104 came off the Canadair production line in Montreal last spring. Also similar to the F-104G is the F-104J which is being built under license in Japan for use by the Japanese Air Force. The first F-104J will be completed early in 1962 by Mitsubishi Heavy Industries.

Supplementing these combat aircraft produced in California, Europe, Canada and Japan, will be two-place fighter-trainer models. At the moment only the Germans have ordered this "F" versions of F-104 but it would seem logical for other nations planning to adapt the F-104G to acquire the two-place version which Lockheed has in limited production. The Belgian and Dutch Air Forces appear to have a requirement for 20 F-104Fs each.

U.S. military aid programs will probably enable nations who cannot afford the F-104F to obtain this trainer version. These programs may also enable additional F-104G orders to be placed by the smaller European nations. For nations with industries not participating in any of the European manufacturing groups, these aircraft would probably be supplied from Lockheed California Division production. Among the nations that are likely to adopt the F-104G are Norway, Denmark, Greece and Turkey, plus, later Spain and Portugal.

Whether or not additional F-104G and F-104F orders are placed it is already clear that the international F-104 programs represent one of the biggest pieces of international trade in world history. On the basis of present non-U.S. commitments for the various versions of the F-104, over $2-billion is involved—about half of which will go to the U.S. industry. ■



Now a new converter with a 3.6:1 ratio and

POWER-LOAD-LOWERING SAFETY, TOO

Now, from Allison, comes a converter with new efficiency, new design elements, new low prices that gives you the safety of power-load-lowering and 3.6 to 1 stall-torque ratio too.

It's the new Allison TC-400 TORQMATIC Converter, a breakthrough in converter design from the people who make the world's most complete line of hydraulic drives.

The TC-400 is as new as tomorrow – but incorporates the time-proved TORQMATIC design features which for years have demonstrated their merit on tough job after tough job.

It can handle from 150 to 250 horsepower, is far more efficient than other converters in its range. It's available with a front disconnect clutch, industrial or automotive flange, tailshaft governor and integral charging pump for operating customer transmissions.

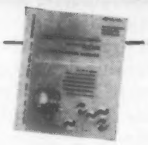
And this 3-element converter offers you a choice of 3 different stall-torque multiplication ratios—from 2.9 to 3.6 to 1—at no extra cost.

Want the full story? Mail the coupon—today.

Allison TORQMATIC® DRIVES

The World's Most Complete Line of Hydraulic Drives

Over 980 Models used by 108 Manufacturers in 100 to 525 H.P. Equipment



ALLISON DIVISION OF GENERAL MOTORS
DEPT. AF-6 INDIANAPOLIS 6, INDIANA

Please send me application data on your TC-400 TORQMATIC Converter.

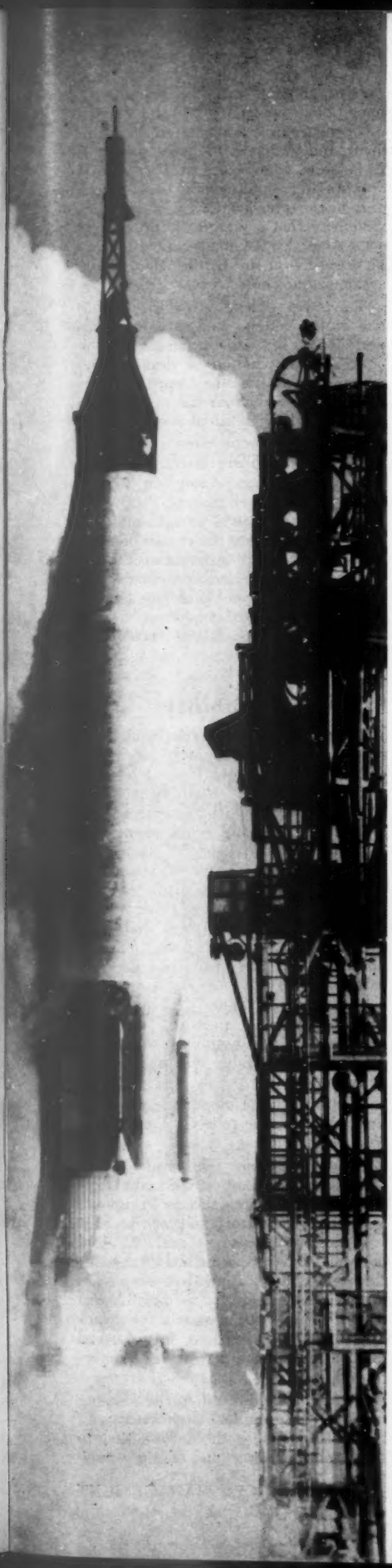
Name_____

Title_____

Company_____

Address_____

City_____ Zone_____ State_____



Crash Programs: Can They Provide Needed Weapons on Time?

Successful crash programs must be run by managers with the power to effect maximum decentralization, minimum committee operation, minimum red tape, and be given maximum priority and adequate authority.

by Robert M. Loebelson

PRESIDENT KENNEDY'S refusal to combine nuclear-ban discussions at Geneva with talks on general disarmament, Premier Khrushchev's insistence that the Berlin crisis be resolved by the end of the year, and the announced U.S. goal of beating the Russians to the moon all mean that the lengthy cold war will continue. And the continuation of tensions means the U.S. will be undertaking many new high-priority programs in the years to come.

Crash projects are hardly new. The Manhattan District evolved the atomic bomb during the war. Four USAF ballistic missiles, Thor, Atlas, Titan, and Minuteman, resulted from special priorities set by the now-defunct ARDC Ballistic Missile Division. The Samos reconnaissance satellite is another Air Force high-priority program. And the Navy's Polaris submarine-launched ballistic missile came into being after creation of the Navy Special Projects Office.

Any general, admiral, or high-ranking civilian testifying on Capitol Hill about deficiencies in our military or space programs is inevitably asked whether a "Manhattan-District-Type" effort would solve the problem. And the ranking Congressman or Senator almost always issues an immediate press release urging a crash project to remedy the deficiency, whether the subject under discussion is a nuclear rocket, anti-submarine warfare, or an anti-missile missile system.

The military services are reluctant to apply special techniques to every new weapon system because they recognize that a "special" label applied widely will lose its meaning. But the Army, Navy, and Air Force, and NASA, will be encountering situations in the near future that will necessitate the use of unconventional approaches.

Some useful guidelines to crash programs have been provided by General Bernard A. Schriever, commander of the Air Force Systems Command, and a team of experts closely associated with the Atlas ICBM project.

In Brief:

Some useful guidelines to crash programs have been provided by General Bernard A. Schriever, Commander, Air Force Systems Command, and a team of experts closely associated with the Atlas ICBM project.

According to Gen. Schriever, the special organization created to administer the program is the key to success, even though the type of organization set up may vary from project to project. And, he added, no group administering a crash program can hope for quick success unless it has:

(1) Maximum decentralization.
(2) Minimum committee operation.
(3) Maximum priority.
(4) Minimum red tape.
(5) Authority to go with responsibility.

The special organization must recognize, Schriever declared, the full impact of advanced technology on high-priority systems.

According to General Schriever, the special organization created to administer the program is the key to success, even though the type of organization set up may vary from project to project. And, he added, no group administering a crash program can hope for quick success unless it has:

(1) Maximum decentralization.
(2) Minimum committee operation.
(3) Maximum priority.
(4) Minimum red tape.
(5) Authority to go with responsibility.

The special organization must recognize, Schriever declared, the full impact of advanced technology on high-priority systems.

"To be successful, it is necessary to insure the availability to the effort of top scientific and engineering personnel," he said. "The days have passed when the development can proceed in small steps, using only the already established engineering practices, adding only a modicum of improvement, and regarding the technical effort as an important but secondary item, while production of a high quantity is the conspicuous aspect around which a program is built."

Involves Some Risk

The AFSC Commander said any crash program must be built around the philosophy of concurrency, i.e., compressing and overlapping research and development, production planning, actual deliveries, training installation, and logistic support.

He admitted, however, that the concept of concurrency involves some risk. It not only "puts a premium on being technically correct" but also increases the chance of required changes during the program as R&D and production overlap.

Schriever emphasized that in any crash project, "major success can come only by being able to alter the program as required, to exploit every new piece of information at every success, and to quickly alter the program if required whenever results so indicate."

The Important Roles

All of the USAF's high-priority projects have entailed the use of a systems engineering/technical direction firm hired for just that purpose. In some cases the company was Space Technology Laboratories, in others Aerospace Corp. What can a systems engineering company do to speed a program?

According to Dr. Ruben F. Mettler, STL's executive vice president, the systems engineering firm has these important roles:

(1) Analyzing military requirements.
(2) Assessing the predicted scientific and engineering state of the art.
(3) Designing (in a preliminary way) a basic configuration to satisfy military requirements.
(4) Specifying the major subsystems and major new facility and test requirements.
(5) Technically directing the on-going design, development and test efforts in cooperation with the military and the other prime contractors.

Dr. Mettler declared it is up to the systems engineering concern to provide for slippage in planning a program. "Where the development time period is scheduled to be short and where the building of major new facilities, production tooling, and the training of operational personnel will be carried out concurrently with design, development, and testing of the basic weapons, the system engineer must also include appropriately interlocking design margins in the specifications for each subsystem so that a reasonable number of subsystem development difficulties can be absorbed in the performance of the system as a whole."

The STL official emphasized that one of the system designers' most important jobs is the determination of the optimum combination of design parameters. After that, they must deliberately back away from the optimum in specifying the individual subsystems.

Another important area confronting the systems engineer is the reliability and test program. According to Dr. Mettler, a good chance of success in a crash program will result "only by constantly analyzing the results of tests, and altering the program, and altering the specifications, and continually pitting the progress and problems against the ultimate desired answer in a race with time, and against the efficient use of resources."

"Crash" Reliability

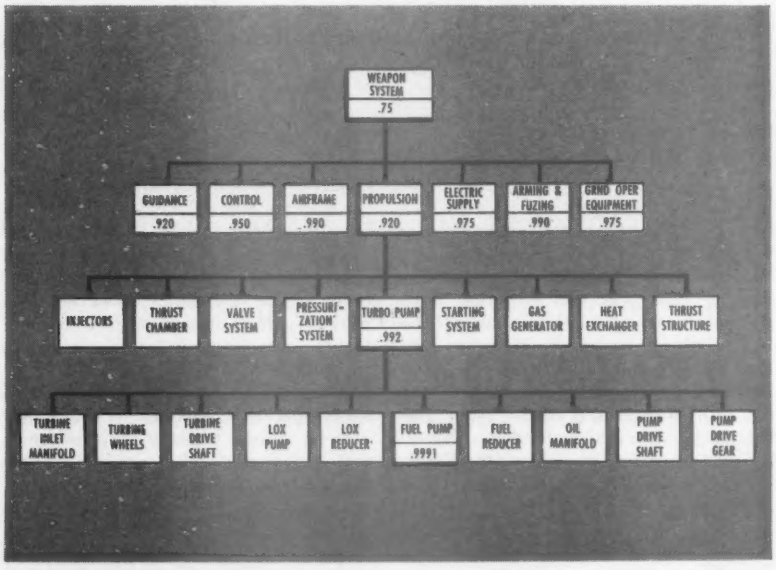
On reliability, Dr. Mettler contended the wise systems engineer does not shoot for 100 percent. "If the reliability objective and the reliability actually obtained is too low, the excessive costs for maintenance and replacement will be encountered when the system is actually operationally placed in service. Conversely, if the goal is made too high and the necessary development test program is laid out to meet that goal, then the development costs and the development time can become excessive." The systems engineer must choose a design point "that makes for the most sensible trade-off," the STL scientist declared. Figure 1 shows what he considers desirable reliability to the component level.

What can the prime missile producer do to improve the reliability of a crash weapon system?

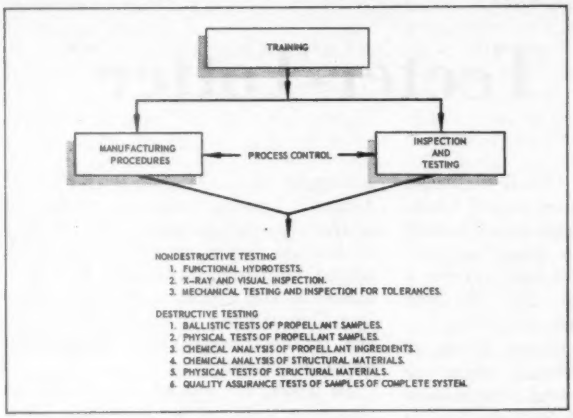
James R. Dempsey, head of General Dynamics/Astronautics, said his firm's experience with the Atlas could provide many answers. The best place to start is in the early design stages. "We told our reliability people to make intensive theoretical and applied analyses in these areas as rapidly as possible, so that the information would be available to our engineers as they worked out design of the hardware," he reported.

Another technique involved keeping track of the technical experience with the Atlas, feeding the information to the manufacturing and design engi-

Desirable Component Level Reliability *(Figure 1)*



Rocket Engine Test Techniques *(Figure 2)*


TRAINING
MANUFACTURING PROCEDURES
PROCESS CONTROL
INSPECTION AND TESTING
NONDESTRUCTIVE TESTING
1. FUNCTIONAL HYDROTESTS.
2. X-RAY AND VISUAL INSPECTION.
3. MECHANICAL TESTING AND INSPECTION FOR TOLERANCES.
DESTRUCTIVE TESTING
1. BALLISTIC TESTS OF PROPELLANT SAMPLES.
2. PHYSICAL TESTS OF PROPELLANT SAMPLES.
3. CHEMICAL ANALYSIS OF PROPELLANT INGREDIENTS.
4. CHEMICAL ANALYSIS OF STRUCTURAL MATERIALS.
5. PHYSICAL TESTS OF STRUCTURAL MATERIALS.
6. QUALITY ASSURANCE TESTS OF SAMPLES OF COMPLETE SYSTEM.

Test Records of 3 Rocket Engines *(Figure 3)*

	XM-20 (X-17-RTV1)	XM-55 MM – Wing I	LR-89 ATLAS
1. NUMBER OF COMPONENTS	6	9	33
2. NUMBER OF COMPLETE ENGINE DEVELOPMENT TESTS .	6	132*	3177
A) ENGINEERING DEVELOPMENT AND STORAGE TESTS	1	82*	3126
B) PREFLIGHT RATING TESTS	5	12	
C) QUALIFICATION TESTS	0	18*	
D) DEVELOPMENT FLIGHT TESTS	0	20*	51
3. ACCUMULATED RUNNING TIME TO DATE	1220 SEC	2350 SEC	155,730 SEC
4. TOTAL FLIGHT TESTS TO DATE	30	1	74
5. FLIGHT FAILURES DUE TO 1ST STAGE PROPULSION	0	0	4
6. RELIABILITY DEMONSTRATED (90% STATISTICAL CONFIDENCE)	95.7	90.5	91.4

* PROJECTED TO COMPLETION OF WING I

neers so they could make the improvements in later production models of the ICBM.

Dempsey reported this approach normally worked out well. But if action was not taken quickly, a report was filed with top management and a special committee headed by Dempsey was made responsible for incorporating the modifications dictated by the failure-analysis reports.

Reliability Techniques

Reliability—the bugaboo of any crash program—will inevitably bother the propulsion companies involved in a high priority project. On this point, Thiokol Chemical Corp.'s vice president, Dr. Harold W. Ritchey, emphasized:

(1) Propulsion systems can be made just as reliable as needed, but important factors like cost, schedule, and performance must be considered in setting reliability standards.

(2) It does not necessarily follow that large numbers of components make for unreliability in a rocket engine. But complexity does influence the amount of testing needed during the development phase.

(3) Data on the development cycle can be obtained from extensive testing of components, from static tests of complete propulsion systems, and from actual flight tests. Failures are almost as valuable as successful tests because they too provide design information. And flight tests, expensive as they are, represent only about 10 percent of the cash normally spent to get reliable rockets. (Figure 2 shows some of the techniques usable to assure reliable rocket engines and Figure 3 demonstrates typical tests records of the XM-20 and XM-55 solid rockets and the LR-89 liquid rocket engine.)

For electronics firms involved in crash projects, the experiences of General Motors' AC Spark Plug Division might be helpful. Dr. B. P. Blasingame, AC's director of engineering, reported his firm budgeted the guidance system development program for several USAF missiles.

"At the outset of any program, we set up the goals to be achieved. We start out with what we actually call a reliability budget for our system. We state what is the mean-time-to-failure to be achieved by each element of the system. Just as in the business budget, we set up what is to be accomplished by each separate department. We then set up test and analysis procedures to measure performance against this budget throughout the design process."

But, Dr. Blasingame reported, today's typical guidance system contains 20,000 to 30,000 electronic and electromechanical parts—10 times as many as in the early missile guidance systems. This means the development budget process must be backed up by two programs introduced by the USAF.

Parts, Design Review

(1) Parts Qualification Program involves testing of sample parts in an environment exceeding that of the missile itself. These parts, e.g., transistors, synchro-motors, tantalum capacitors, were costly to qualify. But enormous numbers of parts have been run through the process and designs exploiting these parts have a high probability of success. Individual systems manufacturers are exchanging missile and space parts tests data through the tri-service Interservice Data Exchange Program. IDEP means that relatively little testing must be done on new projects if qualified parts are used. (On the Titan guidance system, only 20 percent of the parts had to be tested.)

(2) Formalized Design Review helps assure meeting reliability requirements. In the past, an individual engineer's design was informally discussed with his supervisor and reviewed by an experienced designer. Now each designer must compute the stress levels of all parts in his design and provide the data to an applications review team. To aid the designer, AC gives him a parts selection manual kept up to date by the parts qualification program, parts derating manuals, and design standards. Without these manuals, compiled from prior experience, an engineer could not "design in" the reliability needed.

Factory, Human Tests

Dr. Blasingame indicated AC feels one way of assuring a good chance of guidance system success is to have the flight test done on the same articles which will be used operationally. As a result, flight tests are made on equipment produced on production tooling by the same people who will ultimately turn out the operational units. This "pilot line production process" even means that early engineering models are produced by AC's manufacturing people—the concurrency principle at the factory level.

And Col. Carroll N. Bolender of the AFSC's Aeronautical Systems Division at Wright-Patterson AFB, Ohio, stressed one point which everyone engaged in work on high-priority systems must take into account.

Said Colonel Bolender, "Man is a vital part or component of all USAF weapon systems, and we have to understand him and design him into the system in order to optimize man/machine relationships."

These views, expressed by men who have had extensive experience with crash programs, should serve as a guideline for any similar projects begun in the future. Even though the procedures discussed did not always result in getting high-priority programs ready on an exact schedule, they nevertheless represent a tested method of operation. ■

Pentagon Profile / Charles J. Hitch
Assistant Secretary of Defense (Comptroller)

"To Balance the Teeter-Totter"

WHEN 51-YEAR-OLD Charles Johnston Hitch was named Assistant Secretary of Defense (Comptroller) early this spring, no other appointment, short of the Defense Secretary's itself, created quite as much stir, both in and outside Pentagon corridors.

One reason: in the 13-year history of the Department of Defense, where top appointees have acquired a reputation for short tours of duty (average time in office: slightly less than two years), only two other men had held the comptroller's job. One, venerable Wilfred J. McNeil, had kept a tight fist clamped on the Pentagon cash register for over a decade, often, in effect, had actually run the whole department itself through his unmatched knowledge of where Defense's resources were and how they were being used. The other, Franklin Lincoln, took the job when McNeil retired, knew full well, with a major election year approaching, that he could expect to do little more than keep the fiscal house in reasonably good running order until the voters made up their minds.

Thus, because just one part of his job (supervising and directing Defense budget preparation) is monumentally big enough to warrant him considerable attention anyway, and because the comptroller's office has long been a key to effective Defense operations, i.e. the often white hot soldering iron that binds programs and dollars together, Hitch's background became of immediate interest to just about every layer of the military management structure.

How he felt about the way his job should be run could provide significant clues to the rest of the organization on what, in the future, was going to be important and what wasn't.

Hitch's background provided some of the clues:

A Missourian, honor graduate from the University of Arizona (in 1931), Hitch spent a year of graduate study at Harvard, went to Oxford on a Rhodes scholarship, received his masters and became a fellow tutor of Queens College, Oxford—a position he held, with time out for war service, until 1948.

As general editor of the Oxford economic papers from 1941 to 1948 and a visiting professor at the University of Sao Paulo, Brazil, in 1947, Hitch served in World War II as staff economist for the Mission for Economic Affairs in London, was staff coordinator of the planning committee of the War Production Board in 1942 and 1943, served from then until 1945 as a lieutenant in the Office of Strategic Services, then as Chief of the Controls Division of the Office of War Mobilization and Conversion.

In 1950, he moved to private industry as Chief of the Economic Division of Rand Corporation—a heavy thinking research and scientific consulting firm which leases its brainpower out on contract—mostly for the U.S. Air Force.

However, most of Hitch's thinking (on how the budget should be controlled) developed when he was at Rand Corporation where he headed the economic division for about 12 years. Most of his career there has been spent on the economic implications of cold war military problems and weapon systems. The Air Force, he notes, had begun looking into this thing quite a few months ago, has "pretty much broken the back of the analysis by complete weapon systems costs problem."

When the New Frontier reached out to California to call him to the Pentagon, Hitch said of his new job that, "it won't be a change of work but a change of responsibility."

But probably the best clues to how Hitch would be acting were to be found in the third, and the most recent, of his brain-taxing books. Published in 1960, it is titled "The Economics of Defense in the Nuclear Age," has become a Pentagon "bestseller."

Summed one high ranking officer, "putting McNamara and his new comptroller together on the same team brings a fresh approach to the management planning and financing of the Defense effort. Hitch's thinking, and the organization that he has set up, show an awareness of the basic foundation that will be required for true unification. This may well be the first orderly and well staffed effort to utilize an across-the-board approach to Defense planning and funding."

Although that is quite likely to become a practical fact of Defense operations, even if it doesn't show up on the organization charts, this is not the primary concern of Charlie Hitch. What does bother him is how to make the budget what many financial experts have long contended it is not: an ef-

fective thermometer on top management decisions.

Hitch's goals:

1—Tie plans and programs to the budget, so closely related, with emphasis on plans and programs within "realistic limits," so that the annual budget is really only a slice of much larger picture. Hoped-for result: the budget see-saw would be brought into balance—military needs and requirements on one side equalling national resources available on the other.

In the past and even to the present, the teeter-totter went up and down. Biggest headache: there has never been any sound organized way for the separate services to know, until the last minute, just how much the cost of what they were going to say they need correlated with what the Nation was going to indicate it would willingly spend for Defense.

The Guessing Game

Military looked at mission requirements and what they thought they would cost with little more than an educated guess as to what they might be allowed. OSD put together the dollars with little chance of finding out how much the military was really going to say they needed. Then the Joint Chiefs tried to paste the whole thing together to take to the Hill.

2—Get more economic, cost effectiveness evaluations on the plans and programs side.

"Plans and programs, from an economic standpoint, have to be done in terms of weapon systems. It is the only way the Pentagon top level can make sensible evaluations."

To crank this operation into standard Defense procedures, Hitch's office is going through a two step process:

1—A proposed programs phase. Military programs, closely related on a mission basis, have, during the summer, been drawn up for submission to the Secretary for decisions.

2—His tentative decision on programs will be the guidelines for preparing the fiscal budget due in October —for Defense top management review.

"Once we get the system rolling," says Hitch, "we will approve programs outlined (among other places, in a chart on Hitch's wall) on a five-year basis (a look forward that many Defense experts have long advocated).

If successful, this new procedure should make the whole budget cycle much easier. One reason: theoretically at least, budget changes in the future will be a reflection of changing circumstances, not, as a great many of them are now, as a result of some one of the services "over-requesting" on an initial budget preparation.

Although the new procedure, in theory, is sound, the whole operation will be difficult to set up, mainly because it is a terribly ambitious program, may well be too much to try to do in one year.

Significantly, this is the only aspect, sheer workload, that really worries Hitch. And even here, if desire will hack the problem, "service cooperation on the project has been excellent."

His Biggest Hurdle

Hitch admits readily that he needs much more background in Army and Navy problems in order to get this project to work on a defense-wide basis. "To some extent, Army and Navy problems here are tougher because they have more complex force structures," but, still, Hitch doesn't feel this will be a major stumbling block.

What could well be his biggest hurdle is the machinery itself, or lack of it, that he creates to do the job. An idea of what this might be, specifically, has already been voiced, not by his own people, but by a former program expert who is (1) impressed with what Hitch is after; (2) aware, because he's been somewhat the same route before, on a smaller scale.

The comment: "Little thought has been given to the need for one of modern management's best tools, the computer—an essential for all the masses of information he will have to correlate.

"They've already run into trouble in their fist exploratory effort in this area, learned they were lacking in savvy about the need for and availability of one. And they've given virtually no thought to PERT—but on the long haul, without it, all his data will run the risk of being much too empirical and create a pitfall which could kill the whole idea."

Beginning with the granted fact that "in Defense operations, the man who controls the dollar runs the show," predications are that this will, in fact, provide a tool for services and the Defense Secretary which, for the first time will tell them how much what they want to do is going to cost—and help them decide if it's worth it.

Hitch says, in sum: "The success of this new undertaking will depend very heavily on the sympathy, understanding, and active support of all levels of management in the Defense establishment."

From the impressive amount of separate service cooperation he has received so far, it is clear, at least so far, that the separate services have dropped whatever partisan qualms they might have had about minor points in the whole process, intend to do their best to see that the project succeeds. ■

type

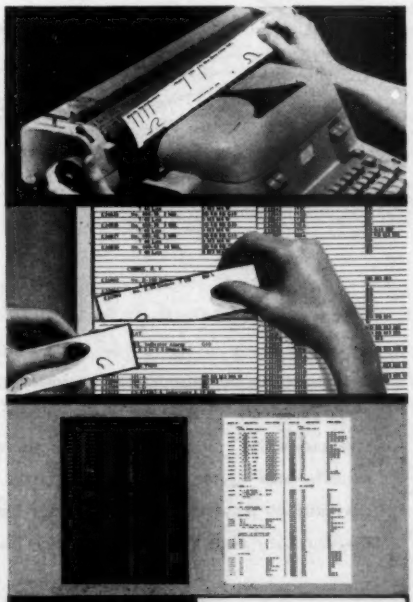
each item change on a separate card

insert

. . . into your Acme photo panel

print

. . . your fresh new list with standard office duplicating equipment after photographing panels.



ACME VISIBLE

ACME PHOTO PANELS MAKE SHORT WORK OF LONG LISTS.

Maintain your own lists (parts, catalog, directory or index) . . . or let Acme do it for you. Send coupon today.

ACME VISIBLE RECORDS, INC.
8008 West Allview Drive, Crozet, Va.
Please give me information on Photo Panels for timesaving preparation of directories, catalogs, price and parts lists.

NAME_____ TITLE_____

ADDRESS_____

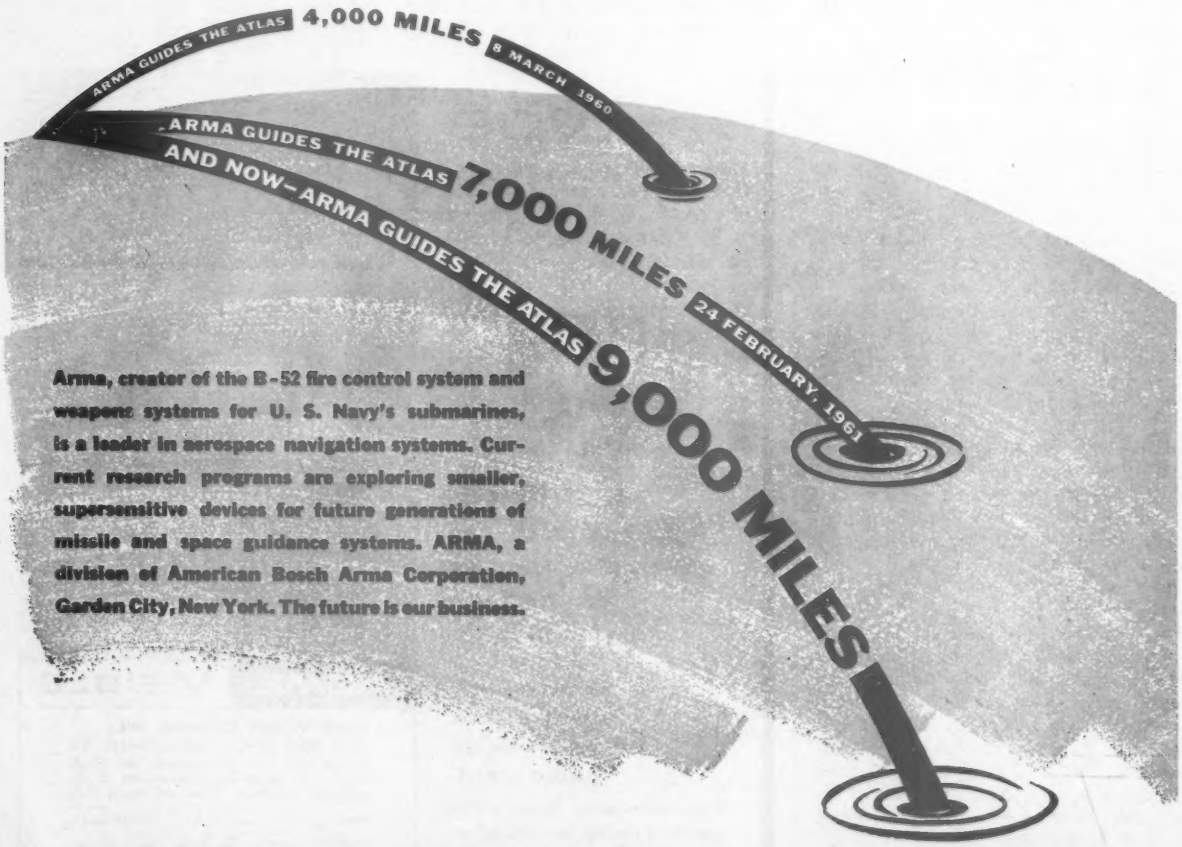
CITY_____ STATE_____

ARMA guides Air Force ATLAS in first full-range inertial flight

Cape Canaveral July 7, 1961. The Air Force announced the successful flight of an Atlas ICBM guided by the Arma inertial system 9,000 miles into the Indian Ocean.

A giant step in missile and space technology, this important feat of pin-pointing a target nearly half-way around the world demonstrated the phenomenal accuracy and reliability of Arma inertial guidance—America's first inertial guidance system of intercontinental range accuracy. This flight was another achievement of Arma inertial guidance which has performed successfully on every flight since the initial test in March 1960. Today the Arma system is in full production.

Arma inertial guidance provides our nation's ICBM arsenal with all the advantages inherent in inertial guidance—salvo firing, all-weather capability, immunity to outside interference, a minimum of costly ground equipment. Although specified for the Atlas missile, the Arma inertial system as a completely self-contained, self-correcting navigation system is adaptable to other aerospace programs and space exploration projects.


ARMA GUIDES THE ATLAS 4,000 MILES 8 MARCH 1960
ARMA GUIDES THE ATLAS 7,000 MILES 24 FEBRUARY 1961
AND NOW—ARMA GUIDES THE ATLAS 9,000 MILES
Arma, creator of the B-52 fire control system and weapons systems for U. S. Navy's submarines, is a leader in aerospace navigation systems. Current research programs are exploring smaller, supersensitive devices for future generations of missile and space guidance systems. ARMA, a division of American Bosch Arma Corporation, Garden City, New York. The future is our business.

AMERICAN BOSCH ARMA CORPORATION

Research Rundown

How OSD Will Operate

With half a year under their belt, top OSD officials are beginning to make clear how they intend to run Defense. Among the rules:

Item—There must be strong overall central direction from the third floor (where most OSD assistant secretaries work). "If we are required to operate only in the policy area, we are nothing." Translation: top OSD staff will try to stay broad but make it clear they intend to dive into actual specific hardware decisions if they think it's necessary.

Item—Organization difficulties are ones of degree, not of structure. Says OSD, "there is too much of the feeling today that we don't really belong to anybody." OSD intends to change all that, make it clear that they intend to operate in fact as the laws on paper indicate they are supposed to operate.

Observed one service secretary, significantly: "much of what they are doing on the third floor is admirable, particularly in launching penetrating inquiries into problems that have been swept under the rug for years.

"We might argue with some of the decisions, and probably will, but we've got to allow for the fact that we will win some and lose some. The important thing is that we are finally getting decisions fast so we can go ahead and *do* something."

Manned Aircraft Future In Doubt

Air Force counterforce advocates are more disturbed over what their own bosses *may* do, rather than what they may not be able to do, as a result of Russia's flexing its manned aircraft muscles recently in Moscow.

Summed up one, "Merely buying more copies of what we already have isn't going to be the answer to the threat—it'll only make us more vulnerable."

Manned aircraft experts, particularly those involved in nuclear powered aircraft, continue to do a slow burn over top Defense statements on what manned vehicles will be needed in the future. What rankles most: top officials have stated they needed a plane which will do just the sort of thing ANP was designed to do, but they need it sooner than ANP would have been ready. Said one technical expert, "no matter what the timing, if they are really serious about needing this capability, how can anyone in his right mind believe we can take the second step—before we've taken the first?"

Background of GEM Competition Snag

Army and Navy planned last month to award a contract for the development of a troop-cargo ground effects machine transport, hit a snag when Navy couldn't come up with the necessary funds. Competition was down to three companies, with one competitor reportedly favored for final selection when Navy's threadbare financial cupboard was discovered.

MATS Shopping For VTOL Aircraft

While a tri-Service survey is being conducted in the U.S. for a VTOL transport aircraft, European companies have gotten down to some serious thinking—have set the VTOL program up as an R&D project. Services might be wise to check into the European program for their VTOL transport, may be buying their VTOL fighters from European countries.

One Service "little brother" laying back waiting for the smoke to clear at higher levels over the VTOL indecision is the Military Air Transport Service.

One MATS official explained: "We're just sitting back waiting for a sure-fire VTOL aircraft and then we'll put in our bid. Once we get it, we'll be able to fly in, discharge our troops and cargo, take off without worrying about setting up runways and terminals."

Research Rundown

System Office To Speed AF Projects

The Air Force will depend on a series of system offices to expedite development management of its high-priority weapons and regulated systems.

As reported by *Aviation Daily*, a hand-picked group of select technical officers with the rank of Colonel or even higher will man the new offices (called SYSTOs). Ten of these staff level offices are planned, to streamlined management of unique or highly sophisticated systems.

The new procedure became effective July 1 with announcement of AF reorganization at staff level. Although only four systems have been officially tagged for SYSTOs (Minuteman, Titan, Atlas and B-70) other likely candidates include: SAC control system 465-L, Dyna-Soar, Saint, Midas, Sky Bolt, and solid fuel boosters.

SYSTOs need not always number ten—nor will they be confined to the development programs picked by the AF Secretary initially. As special management procedures and controls become less critical, individual programs may be withdrawn from the SYSTOs list and other, more critical programs added. However, ten or a dozen is about the maximum number planned at any one time, keeping those projects given special handling to a manageable minimum.

Urged to develop priority handling for critically needed systems, patterned after Navy's (PERT) procedures in developing Polaris, the AF has settled instead on the SYSTOs concept to expedite staff level handling. The decision resulted from the need for managing many development projects of the size and complexity of Polaris.

Biggest advantage the AF sees in the SYSTOs concept is the hope it will speed reaction time and decisions on project problems by short-circulating the usual chain-of-command handling—via the weapons board, through the Air Council, AF chief of staff, and to the AF secretary.

As envisioned by its proponents, programs under SYSTOs management will handle problems posed by operating divisions—such as Ballistic Systems Division (BSD), Englewood, Calif., or from Air Force Systems Command (AFSC) headquarters itself—by submitting them directly to a liaison secretariat serving both the AF secretary's Designated Systems Management Group (DSMG) and the Systems Review Board at Air Staff level.

If time permits, the appropriate SYSTO, on the scene in Washington, will thresh out the recommendations to DSMG for approval at secretary level. If time is too short, he could take urgent queries directly to DSMG.

As AFSC Chief, Gen. B. A. Schriever would be able to delegate problem solution through the appropriate Washington SYSTO, or he might go directly to secretary or Air Staff levels for action.

Projects placed on the SYSTOs list may not even be a higher priority than those remaining directly under Brig. Gen. Milton B. Adams, director of systems acquisition; or under Brig. Gen. M. C. Smith, director of systems services.

Principal consideration in giving a project special handling would be their unique or specialized nature. Thus, a missile or aircraft whose development pattern might be similar to prior efforts might be high priority, but require no special management handling.

Sea-Launched Satellites Studied By DOD

The Pentagon's research and engineering office has informed the House Space Committee that its plans to undertake a cost analysis of the desirability of developing a mobile sea launch capability for certain satellite and booster space shots.

In a report on dual hearings into the feasibility of equatorial launch sites and sea launch techniques, the committee concluded that the latter has some advantages but agreed with NASA's contention that the "price appears too high in terms of cost of construction and operation, logistics problems, and political complications."

The committee noted that an earth satellite launched on an equatorial plane takes full advantage of the rotation of the earth. "Such a satellite can be injected most easily and least expensively into an equatorial orbit when the launching site is located near the equator." While NASA concedes these benefits, it is the space agency's judgment that this "performance increase does not constitute a firm requirement for a launch site at this time, when all things are considered," the committee said.

The committee said neither NASA nor DOD has taken a final position toward development of mobile launch capability. "In summary, mobile sea launch would seem to have some advantages, mostly reflected in economy of operation as it applies to individual shots which, for reasons of safety or in order to achieve a specific orbit, now require doglegging the trajectory of the trajectory of the vehicle," the committee said.

Critics of the proposal say that it will not merely involve converting a ship or two but that a significant sea launch capability would involve a whole fleet of vessels. Proponents contend that conversion of available ships and floating drydocks could be achieved economically with side benefits in military communications, reconnaissance and antisatellite operations.

20-Year Forecasts Distributed By Army

Technological forecasts prepared by each of the Army Technical Services to indicate anticipated progress for the next 20 years are being distributed.

An overall Army-wide forecast is being prepared by the Army Research Office and is expected to be off the press shortly. Distribution of this forecast and of the Technical Services' forecasts will be limited to Army and other interested Government agencies.

Representative of greatly increased emphasis on the relatively new art in the Army of forecasting technological capabilities and intended to assure continued superiority over any potential enemy, the forecasts were directed by the Chief of Research and Development.

Army To Test Radio-Telephone System

The Army will soon begin testing a radio-telephone system which has an initial range of 15 miles.

The communications system has been developed to handle 700 subscribers, each being able to communicate with any other subscriber with a minimum of interference. Each person has full use of his equipment at all times.

A $98,000 contract has been awarded the Orlando Division of the Martin Company for purchase of preliminary models for evaluation and test purposes of the system known as RACEP (Random Access and Correlation for Extended Performance).

The Army feels that the system, whose range can be extended beyond the present 15-mile limitation, can prove to be a revolutionary development in tactical voice communication. Messages could be transmitted with some degree of privacy from point to point, outmoding the present radios which can be heard by friendly and enemy forces.

RACEP is the equivalent of a radio-telephone system without wires or central switchboard.

Progress Report On:

Mark Bradley's Money Tree

Periodic Service drives to increase efficiency are nothing new to the military. What is new: the amazingly high level of enthusiasm Air Force's Project Money Tree has created. Here are the details . . .

Lt. Gen. Mark E. Bradley.

THE VENERABLE *Aviation Daily* observed one day last month that: "an all out program among the Armed Services, particularly the Air Force, to demonstrate fiscal efficiency (in operations and maintenance) is apparently proving about 66.66% impressive—House is asking only a 2% across-the-board procurement cut in FY 1962 instead of the 3% demanded in FY 1961."

While the services have tried, justifiably, often, and usually unsuccessfully, to prove that "occasional errors notwithstanding" their efficiency in handling resources is easily as good as the performance of any other group large or small in the country, to at least one Air Force General, DCS/Systems and Logistics Mark E. Bradley, one nickel wasted is one nickel too much —an attitude toward Air Force business practices reminiscent of Air Force Chief of Staff Curtis LeMay's one-time attitude toward Strategic Air Command combat readiness.*

Last October, Gen. Bradley called a worldwide conference of major command deputy chiefs of staff and directors for Materiel at Norton Air Force Base. The idea: "to see if we couldn't reach an agreement on what our major problems are, attack them on a united front."

What he heard convinced him that the whole Air Force had more than enough cause for launching a powerful, concerted war to improve material management. He told the conference attendees to come up with a program for their commands by January, '61, ready for implementation.

Summed up Bradley: "all the problems which came out at that meeting revolved essentially around an obvious need for greater discipline in materiel operations thinking." On the way back to Washington in what he describes as a "speedy C-54," Gen. Bradley mulled over how these soft spots in performance had cropped up. His conclusion: a good deal of it was left over from the wartime philosophy that "an operational unit in the field could get anything it needed out of the Pentagon; just ask. It is sort of natural," says Bradley, "to worry less about common property than a man does about his own personal property. It's not hard to see how the idea could build up in an organization this big that the Pentagon is just a huge money tree."

By the time he landed in Washington, Gen. Bradley had the catch phrase name for the monumental effort soon to be launched: Project Money Tree. (Staff personnel in his Washington office argued, told him the name was a poor choice, inferred all the wrong things. Answered Bradley, who has a widely recognized reputation for being hard headed and frank talking, "thank you very much for your advice, but the irony in that name is obvious to me. We'll call it 'Money Tree.' ")

To emphasize that Air Force in fact doesn't *have* a "Money Tree," Bradley manufactured a rather grotesque looking potted plant—a small bowl of silver dollars wrapped in colored paper "leaves." About six inches high, it sits on his office bookcase, is very carefully pointed out to any and all of his frequent visitors.

But Gen. Bradley's real contribution to Money Tree has been far more substantial than dreaming up catch phrases or building gimmicks. To make sure this program got something better than a cursory glance from the rest of the Air Force, Bradley made two key moves:

1—Snapped a series of slides which showed graphic glaring discrepancies between how well the management side of military operations was supposed to be performing (according to various command reports) and how it was actually performing;

2—During a ZI conference of major Air Force command chiefs, Bradley showed his slides (mainly to enlist their backing for their own materiel officers in the ballooning project), got a shocked reaction from CO's at what they saw, the general comment that "we didn't know *this* had been going on."

Among the specific comments:—asked hard driving SAC Commander Power, "who should I court-martial?" Answered Bradley, "maybe you should start with yourself."

The laughter that followed had turned into a head-knocking roar by the time Power got back to Omaha. Key result: "all the CO's have really gotten after this thing," says Bradley. The brightest star in this whole galaxy of activity, SAC's Money Tree Program Plan is about 4 inches thick, their quarterly progress report would make a good sized book and "the progress chart room at Offut that keeps track of how well they're doing looks, with all those colored lines and bars, like the inside of a rainbow."

Other significant SAC moves: picking a Money Tree monitor for each of its bases, holding him responsible for making the project "a base crusade," emphasizing the logistics function with headquarters staff visits to bases, briefings "on why the Money Tree philosophy is important."

Nor did Bradley (or his Money Tree project officer, Brig. Gen. Andrews) let the project go at nothing more than a

* A colonel once complained that his efficiency rating had been reduced because an eagle flew into one of his aircraft and damaged it. Retorted then—SAC Commander LeMay, "we can't afford to distinguish between the unfortunate and the inefficient. The result is the same."

Some of Money Tree's "Acorns"

IDEA OF JUST HOW FERTILE is the hunting ground for Air Force cost cutters to be found in one lone paragraph of SAC's 132 page first quarter report on its progress with Money Tree, this one concerning only the electronic inventory control system. Says the paragraph in part:

"Supply inventories (of electronics gear) within this command were and continue to be valued in excess of $800-million; the average supply activity maintains some 50,000 items of stock and some 45,000 transactions valued at $2.350-thousand occur monthly—hence management becomes a prime requisite."

Noting that "Supply people are far ahead of the rest of the Materiel functions in getting results," Air Force is accumulating an arm-long list of money or time or personnel saving ideas. Among the more recent:

1-Substituting the AFM 66-1 (Data Maintenance Collection) system for routine consumption report (designed to compute spares requirements, evaluate spares buying programs, distribute supplies, and analyze materiel failures, make product improvements, eliminate unneeded maintenance and inspections, project depot master repair schedules and develop manpower criteria) has cut the number of man hours required in the processing time, for such reports, at Air Force Logistics Command alone by 4 million man hours, has reduced the number of UR's required from an average per quarter of 22,500 in calendar year '59 to a first quarter consumption in calendar year '61 of only 1800.

2-Davis-Mountain Air Force Base has reduced on-hand inventory of excess and surplus "complete aircraft" by $500-million during the first three months of this year, expects similar performance for the rest of the year.

3-Supply is developing a system to identify causes of failure due to supply deficiencies. Idea started with missiles, will include, where possible, like data on aircraft, aircraft age and ground communications and electronic systems. If it works, Air Force will be able to beef up its ability to identify and respond to what are now frequently crippling supply deficiencies.

4-Zeroing in on transportation costs, responsible Air Force personnel, through better concentrated planning, airlift consolidation, are running up a "savings record" which is already in the several-million-dollar category. Among the examples: an estimated future savings of close to a million dollars annually by consolidating passenger and cargo airlift to DEW line stations in Canada.

5-(Supply) re-aligning ZI eternal storage of POL stock to fit present needs is eliminating over 1.25 million barrels from inventory and, connecting Castle Air Force Base, California to a common carrier POL pipeline has eliminated a $250,000 military construction project for POL storage, will reduce transportation costs $44,000 a year.

6-By a recent reorganization, the Air Force Academy reduced personnel costs $88,000, eliminated 28 transportation personnel spaces; Academy consolidated its requirements for common commodities with three nearby installations, took advantage of quantity buying discounts, reduced car and truckload shipment costs and administrative expense.

7-Almost immediately after Money Tree was launched, SAC took a swipe at eliminating unneccessary paperwork (forms, reports, etc.) required of their technicians, it eliminated 22 SAC forms and two daily reports immediately, recommended that USAF drop an additional 26. Score for the first four months of "61: 48 forms, reports or procedures wiped out, another 31 recommended for the same kind of treatment or "optional use only."

Among some saving highlights:

AF dropped 70 types of ground vehicles (trucks, et al) from the planned Air Force shopping list, thus avoided having to ask the Pentagon for "another" $73-million "to carry out our mission."

(Preliminary Estimates)

Alaskan Air Command	
Reduction of Contract Technical Service	$ 496,000
Air University	
Turn-in of Excess UAL Equipment	$ 249,368
Air Force Systems Command	
Reduction of Contract Technical Service	$ 479,695
Air Force Logistic Command	
Reclamation of Aircraft Spares	$ 85,624,150
Packaging Improvements	$ 691,793
USAF Academy	
Redistribution of Excesses	$ 1,000,000
Air Force Security Service	
Reduction in UALS	$ 1,820,601
Strategic Air Command	
Reduction in Combat Launch and Recovery Kits	$ 25,004,258
Redistribution or Reduction of Base Supply Inventories	$146,207,083
Modification of B-47 Test Equipment to Meet B-52 ECM Requirement	$ 4,000,000
Tactical Air Command	
Reduction and Redistribution of Test Equipment	$ 886,331
United States Air Forces Europe	
Turn-in of Excess UAL Equipment	$ 1,040,337

lot of hurrah about the value of economy. Command programs had to set milestones, file quarterly reports with Bradley designed to show not only what they were doing but how well they were doing it. In addition, Andrews' staff began spreading around what they call the "acorns," i.e. saving ideas unearthed at one command, to the other commands through a monthly newsletter. (One of Money Tree's first results: initial newsletter publication brought a flood of mail which told Andrews, in effect, "why do you print the Money Tree news on only one side of a sheet of paper. Print it on both sides and save.")

Enthusiasm has even spread down to the grass roots level. Bradley literally traveled over most of the world spreading the Money Tree word, has discovered that it is the rare enlisted man on the line who doesn't know what Money Tree is all about.

One important reason for Money Tree's success so far: without question, it has gotten top CO backing. Said one officer, "this shows what can be done when you take the natural desire most officers have in doing a job well anyway and put the heat on management to improve."

Example: stopping off at the Military Air Transport Service installation in Iceland, he asked the commander if he "knew about Money Tree." Answered? "Hell, we're living on it." One result: Bradley was shown a now-barren storage area which before Money Tree had been crammed with miscellaneous supplies.

One object, says Bradley, "is to get people thinking economically. This will automatically save in future procurements." Money Tree's basic goal:

instill an attitude to SAVE. Example of what "attitude" can do: "With Power at SAC, anything to do with Money Tree, all you have to do is lay it on Power's desk to "get action."

Money Tree's main theme: get people to climb up out of the rut of routine. Example: one long-time complaint from all military services has been that they can't get enough funds for maintenance. Since Money Tree, the CO's answer has been "do it with less, because you can." No one, understandably, has ever tried to estimate the number of resources wasted each year because people running the supply pipeline don't stay interested in saving money—but the old professionals will tell you it's probably prodigious, lately have been citing this Money Tree example:

There are approximately 20 alert lights, warning of fire, on F-100. Cost: $32 a piece. Air Force estimated it used to buy 20,000 of these a year, throw them away when they quit functioning because "they couldn't be repaired." Until Money Tree, the Third Air Force had done the same thing.

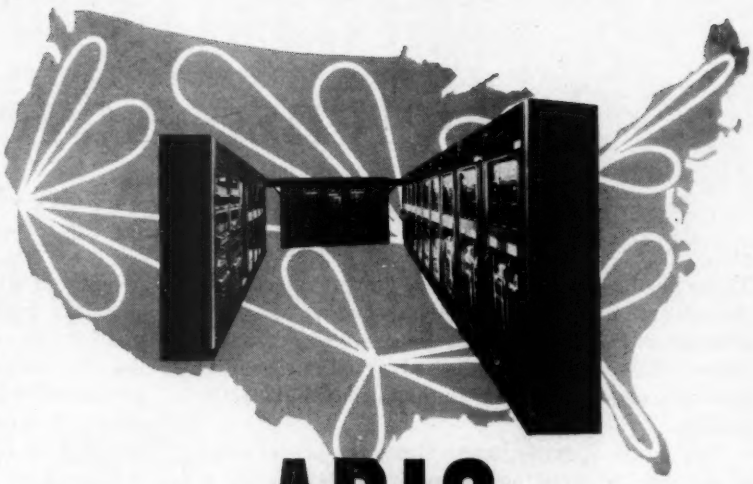
But after Money Tree was launched, Air staff discovered that a Third Air Force sergeant had rigged up a Rube Goldberg test stand, was repairing the lights—and had been for four months —even though the tech order says they are to be thrown away.

General theme of Money Tree: the program will be spread through the Air Force from the top down, the results will work back from the bottom up, in a few years, if Bradley has his way, the Air Force will stop and take a look at what it is doing to see if they need a new Money Tree. Says Bradley, "we won't stop at the end of this year, as we had originally intended, I don't think, but will only pause for breath—to see how far we've come—start in again, for at least another six months."

Unfortunately, while Air Force acceptance of Money Tree has been enthusiastic, sister Services haven't been quite so elated. (Significantly, however, Navy is cranking up a "dollar-stretch" program which looks an awful lot like the same thing.)

To make sure the acorns were being effectively cross-fertilized, Air Force threw an all-command conference in mid-July on just that subject to exchange ideas, improve weak areas and program milestone accomplishments for the rest of the "Money Tree" year.

Sums up Bradley, "in any business from running a chicken farm to running an Air Force you can pick up a lot of barnacles in five years. We've got to take a Money Tree review at least that often if we are going to continue to do our job the way it should be done." ■



ADIS

Communications breakthrough

New Teletype Automatic Data Interchange System (ADIS) now enables the Federal Aviation Agency to interchange aviation weather data coast-to-coast ten times faster than ever before.

With this new electronic message switching system, the FAA effects a major advance in the speed, scope and flexibility of its weather communication service—which supports all civil and extensive military aviation in the United States.

Nucleus of the system is a series of five Interchange Centers, located in Kansas City, Cleveland, Atlanta, Fort Worth and San Francisco. Each of these acts as a clearing house for a number of area circuits, or outlying "loops," collecting data from observation points on these loops and providing the area circuits with data from other parts of the country.

Teletype electronic communications equipment at the Interchange Centers carries out an automatic program of sequentially calling data-originating stations, classifying messages by priority, selecting only those weather items wanted at regional stations, and delivering them to the area circuits—all the while maintaining the ability to handle emergency traffic when required.

Ultra-fast communication between Interchange Centers is provided by Teletype punched tape equipment operating at 850 words per minute, utilizing the Data-Phone concept. Stations on outlying loops are equipped with Teletype Model 28 page printer and punched tape units. Speed-conversion equipment permits automatic interoperation between the national circuit and the local loops. Thus the new system, which serves some 2,400 locations, can report weather conditions from any part of the country in a matter of minutes.

The FAA, through the years, has followed a program of continually upgrading its facilities to meet the needs of the nation's growing air traffic. Teletype Corporation is proud of its part in providing communications equipment for this vital service.

TELETYPE®
CORPORATION • SUBSIDIARY OF Western Electric Company INC.
Dept. 77-H, 5555 Touhy Avenue • Skokie, Illinois

Is Defense Advertising Necessary?

There has been a lot of talk lately about the cost of the advertising done by defense contractors. One prominent Senator recently said he was greatly disturbed over heavy defense advertising expenditures. He pegged the cost "to the taxpayer" at $500 million.

This figure is many, many times the actual total of defense advertising expenditures and only a fraction of that total is recoverable. The Senator's facts are wrong; but, even more disturbing, it appears that he doesn't understand the purpose and function of sound advertising. He considers this money down the drain and thinks it should not have been spent.

There are other instances demonstrating a growing wave of anti-advertising sentiment in high government places. They indicate a lack of understanding and represent a threat both to freedom of the press and success of the Nation's defense goals.

We publish specialized business magazines and reference books. Several of these are defense oriented. They perform communications functions essential to our national goals . . . more essential now than ever before because of the complexity of today's technological and political challenges. There are other excellent magazines having the same or similar purposes. We're delighted—because competition is healthy and because there is more to be done than can be handled by any one of us.

Virtually all publications are financed, by and large, by advertising. This is healthy, too; but it is not the primary reason for defense advertising.

We believe that advertising is an effective and necessary tool for the defense contractor. The objectives of defense advertising are many: some of them obvious, others more subtle.

Sales is one obvious objective. It can be demonstrated that advertising, for some defense products, has led directly to sales. In other instances, selling is a long, complex process, where features of current products may not be as important as company reputation. In both cases, the government wants competition for defense contracts—by use of a competitive bidding system, it gets better products for less money. How is a company to compete if it is not allowed the use of sales tools—one of which is advertising?

Recruiting is another obvious objective. Will that engineer who is inspired to contribute to technological advancement in the missile/space age, for example, be interested in learning more about the kind of company he goes to work for? You bet he will, and more power to him.

The dissemination of technical information is a third, and perhaps the most important, objective. The exchange of such information is one of the biggest problems facing both government and industry. And what more effective, more economical means of disseminating necessary technical information exists than the business press? Mills Shepard, who performs readership studies on one of our publications, reports that advertisements are often read as avidly as the editorial pages. And Eastman Research, in a study released May 29, based on more than 100 surveys for 32 business-paper clients over a two-year period, reports that *70% of the readers interviewed read the advertising in these businesspapers on purpose.*

There are many other equally important objectives. Companies must raise capital in order to be able to do the jobs that need doing for defense. Good community and employee relations are considered necessary to a company's well-being. These and other objectives have been effectively achieved by defense contractors through advertising.

The defense industry is made up of numerous private companies facing the tremendous challenge of meeting, in cooperation with the government, our national technological goals. To meet this challenge, the companies must be strong and healthy. To deprive them of the use of effective and honest advertising is shortsighted and wrong.

AMERICAN AVIATION PUBLICATIONS, INC.

World's Largest Aviation Publishers

1001 Vermont Avenue, Northwest, Washington 5, D. C. Telephone: STerling 3-5400

Aviation Daily • Official Airline Guide • Missiles and Rockets • Airlift
Air Traffic News • Who's Who in World Aviation and Astronautics
R. Spruce Company • Home & Garden Supply Merchandiser

EDITORIAL EXCELLENCE

Air Cargo • Skyways • Armed Forces Management • Air Travel
Aerospace Yearbook • Air Traveler's Guide • World Aviation Directory
H & G S M Green Book • Aerospace Facts and Figures

In My Opinion

Buried Heads

The article "What Civil Service Needs: A Real Career Program for Executives" which appeared in the May issue of your magazine reflects the typical embryo thinking which emanates from the Washington level.

The author states that the present Civil Service system has many inadequacies among other things. This everyone knows. Without stating what he is doing within his own sphere of influence and within current authority to overcome these deficiencies, he buries his head in the sand and proposes the establishment of an elite corps.

That idea is old hat and has been abandoned by industry as impractical. Why not learn from them, instead of foisting an impractical idea on a highly impressionable government which is rushing helter-skelter seeking a way out of its Civil Service career dilemma?

Creating a new program or organization is not the solution.

John C. Matejka
Belleville, Ill.

Computer Error

In the excellent compilation in your July issue on the comparison of major computer systems, we note that the RPC-4000, RPC-9000 and LPG-30 are reputedly manufactured by Royal McBee Corp. Actually these computers are manufactured by General Precision-Librascope and marketed by the EDP division of Royal McBee—through Royal Precision corp., a firm jointly owned by Royal McBee and General Precision Equipment corp.

I recognize that this is rather a complex relationship to try to explain. We hope the above makes it clear. Rest assured the above does not constitute any diminution of a very excellent comparison summary.

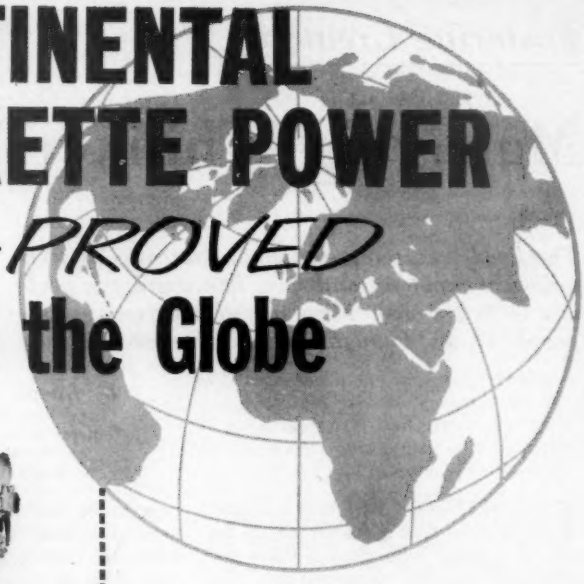
Norman Wicks
General Precision Eqpt. Corp.

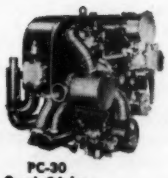
Public Service

I just finished reading your article. "The Positive Side of Procurement" and editorial in the June issue. They are both well done. We in the military services appreciate your efforts to place procurement in proper perspective and believe that in so doing you are providing a real public service.

Vice Adm. G. F. Beardsley
Chief of Navy Material

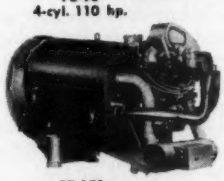
CONTINENTAL PACKETTE POWER
USE-PROVED
Round the Globe

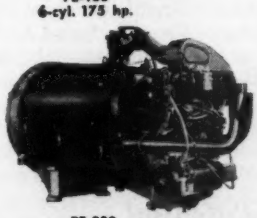



PC-30
2-cyl. 34 hp.

PC-60
4-cyl. 70 h.p.

PE-90
4-cyl. 110 hp.


PE-150
6-cyl. 175 hp.


PE-200
8-cyl. 250 hp.

Ground support equipment built around Packette power is proving itself today on defense installations all over the free world.

Developed by Continental Motors, with the famous Continental air-cooled aircraft engines as their basis, these five Military Standard models [Mil. E-26248 (USAF)] range from 30 to 250 hp, combine compactness and light weight with ease of servicing and upkeep, and operate at any temperature from equatorial heat to polar cold. Of special interest and importance, as simplifying maintenance in the field, is the wide interchangeability of parts among the several Packettes, and between them and the models in the Continental aircraft engine line.

They're use-proved NOW in air conditioners, compressors, crash trucks, generators, test stands, refuelers, heaters, blowers, Rollagons, multi-purpose tugs and other applications. Experience is proving: IF THE APPLICATION FALLS WITHIN THEIR POWER RANGE, NO OTHER ENGINE WILL DO THE JOB SO WELL.

WRITE FOR COMPLETE INFORMATION

Continental Motors Corporation
AIRCRAFT ENGINE DIVISION
MUSKEGON • MICHIGAN

Managing 'Thinkers' Takes Time, Talent

The need for creative thought increases as technological problems multiply. The manager's problem is to get more ideas out of the few creative people he has. Though a new science, the manager must find an atmosphere encouraging creativity, and provide the opportunity for the individual to try out his ideas. "People are born with more creative talent that most use."

by Joseph A. Anderson
Vice President
General Motors Corporation
General Manager
AC Spark Plug Division

THE OLD CONCEPT that so many of us have that a soldier has to be sort of a robot who doesn't think for himself is rapidly disappearing. The soldier today has to be a very versatile person, resourceful, an opportunist and so on—anything but a conformist. I think that in all areas, if we are to solve the problems coming up, we need to be more of the nonconformist type.

I'm not going to bother with any definitions but I expect the reason you are reading this is because you are interested in managing your activity so as to bring out the maximum of creativity in the people under you.

The art of developing an atmosphere favorable to creativity needs a lot of study. We have started on it. We have some answers but not all of them by any means.

Many of the new ideas that come up could just as well have been available to mankind quite a while back. For instance, in medicine how many lives could have been saved if new ideas (now in practice) had come up sooner? Is there any reason they did not come up sooner?

The same thing goes in many fields. Even the ideas that haven't been thought of as yet could be of tremendous importance if we had them today.

Management's Problem

We know this is a much needed thing because the numbers of problems multiply along an exponential curve. Where do we find the answers with the few people we have? It is very important that we increase the productivity of ideas by the people we *do* have.

Management carries within itself a certain amount of restriction, or a deterrent, you might call it, to creativity. This is because good management has to be made up of a high degree of good judgment, whereas high creativity involves risk and taking chances.

Men are selected because they appear to be individuals of sound judgment. I expect that the Army has to have very sound judgment in its officers. This is why they were picked. They have to be right more than they are wrong. But the creative person, on the other hand, maybe has to be the other way. He has to fail many times and not give up. If judged by his batting average on successes and failures, he might not rate very high.

So we have this conflict between the man who has to be a manager because of his good judgment characteristics and yet one who can encourage people to stick their necks out, go out on a lot of wild goose chases and have a lot of failures. Good management is at one end of the scale, high creativity may be at the other. Yet if one is to supervise creative people, he will certainly have to have a high degree of creativity and a love for being creative.

The first principle, perhaps, should be that if we're to have an atmosphere that encourages creativity, we must first provide a management attitude and procedure that welcomes ideas; that sees that any idea gets a good hearing.

One stumbling block we quite often run into is that we'll kill an idea because it will not completely solve all the problems in a situation. So we have developed as one of the principles of creativity that in any suggestion we should try to solve the easy problems first. We shouldn't be too concerned if this new gadget or whatever it may be doesn't solve all the problems.

Unused Potential

Another fact I believe important is that most people have more creativity in themselves than they use. This creativity can be improved greatly by training. Basic, of course, to any training work is the principle: "Let's not give any course at lower levels that we first haven't given at top level." This way, everyone would be talking the same language and not trying to do at one level something the upper level doesn't understand.

In dealing with creative people and trying to establish this atmosphere that is conductive to creativity we must remember that every person is different. It isn't possible to set up a set of rules. and a situation and say we do this, number 1, 2, 3 and 4, and thus solve our problems. Different people are motivated by a number of different things, and I think the psychological studies have proven that maybe there are ten or eleven motives, any one of which can apply to one person but can vary a great deal among people.

In this matter of creating an atmosphere favorable to creativity, it is important that the man who is trying to do this, as a manager, not try to apply any ground rules across the board but to recognize the differences in people and to deal with people individually according to what seems to be their motivating influence. Therefore, it is necessary to make a pretty good study of these people.

In our program we have established a number of principles. We combine our experience and use these in training our people to supervise for promoting creative effort.

Encouragement Needed

Our first principle is that the supervisor should strive to build up an atmosphere which encourages new ideas and changes. He should openly urge his people to be alert constantly for improvement possibilities on their own jobs and others.

One of the things a supervisor should do in order to create a good atmosphere is to be careful in making any kind of changes in an organization or in a department without preannouncing it, telling the people you're going to change something. Even if you're just moving the desk to a new location, there is nothing that demoralizes creativity any more than hearing about a

change for the first time when it is about to be put into effect.

The great supervisor in creativity presents his departmental problems to members of his group as opportunities for creative action. As we noted before, creative people like to think about problems. It stimulates you and gives you something to do when you have spare time.

One of the cardinal principles in teaching creativity is: "How do you state a problem?" One example: Supposing your job was to design a new bread toaster. If you stated, "We want to design a new bread toaster," you'd probably go through the same process of electric resistance and all that. But if the problem was stated, "Let's design a new way of toasting bread," then you see you're not limited to electricity. You might want to use chemistry or radioactivity or something. So when you do present a problem, don't limit it by saying, "We want a new speedometer or a new machine gun or something like that." Instead say, "We want a new way to fire a bullet at so many feet per second or whatever it might be."

The next principle is: "The supervisor should design a positive approach to stimulate and encourage creativity in each individual." The drive which stimulates creative activity should be studied. This knowledge should then be put to use in dealing with the employee. In other words, if you know something about the man and what rates with him—position, recognition, or accomplishment, for example—then you can use that knowledge about the man to appeal to him, to create a better atmosphere for him.

The supervisor should attempt to maintain interest in worthwhile ideas, should such interest begin to lag. In other words, one of the jobs of supervising creative people is to watch when the inventor gets to be a little tired of his idea. They have the habit of doing that. Then the supervisor must say, "What can I do to rekindle that interest? Maybe I should ask the man to lay it aside for awhile, to rest his mind from this problem. Maybe I should give him another problem or appeal to his pride by challenging him."

The supervisor should provide all his people with the opportunities to solve their own problems before he steps in. It's all right to give a lift but let the man solve his own problem.

Let Him Try It!

The supervisor should provide as much opportunity as possible for an individual to try out his ideas. People don't like to turn their ideas over to someone else for the first test. First of all, the other person isn't sold on it like the inventor is himself. He mistrusts the other fellow. Naturally, the other man doesn't approach it with the same vigor as the author of the idea. So, if possible, let people try out their own ideas, at least in the first stages. Later on it will probably have to be turned over to someone else for evaluation.

Now then, the third basic principle. We say the supervisor should at all times be a good listener. He should be sympathetic and have a sincere understanding and interest in a person's ideas. That means that when anyone throws an idea at him, no matter how screwy it is, his first reaction must be very favorable.

Be Objective

The supervisor should be open-minded and avoid biases or prejudices either related to the individual or the idea. He should always keep in mind that conditions change. Yesterday's impractical idea might be practical today.

Every once in a while you should go back and dust off all the old experiments that have failed, because when the experiment was started somebody thought he had a good idea. It didn't work at that time. Maybe it will work today.

We must be very careful that we do not let personal antagonism interfere with an idea. Naturally there are bound to be personality clashes. There are people we like; there are people we don't like. Our objective should be to get the good out of anyone.

Don't let a fellow's poor performance in other areas influence the reception given his idea. Don't reject his idea simply because you want to punish him. Ideas can often be obtained from a complaint or a statement of a bad condition.

Now, of course, another principle is to provide recognition for all new ideas and commendations when deserved. Stress the importance of praise. There are a lot of ways to do that. One is to have a written commendation form. Of course, you can use publicity, articles in your plant paper and your local papers. You can use pictures and other means to recognize people.

A supervisor should actively support the creativity of his people. He should assist an individual in getting help from other departments. Maybe he is a mechanical man and he needs a little chemistry knowledge to make his idea work. He is not in a position to go to a chemistry department and ask for assistance. Maybe they would laugh at him if he came in there and suggested that they could help him come through with an idea, especially if it is far-fetched. Therefore, he should be able to go to his supervisor and the supervisor would say, "I'll call up the chemist to come in here and tell you if that could be done or not."

Sometimes the supervisor can suggest other fields for the idea than the man has thought of himself.

The supervisor should maintain effective communication within his department and with other departments. The great weakness of most organizations that I know of is the problem of communication. Really, how do you talk to your people? Nothing is more demoralizing than when you've thought up a grand idea, written it up in detail and sent it in, only to get a little bit of a note from the boss that says, "We have reviewed this idea and cannot use it." It just makes you boil inside. So work on this matter of how you communicate and how you talk to people, even when you have to reject the idea.

One of the things we have found is that you can improve the creativity of a department by the way you distribute creative people.

You find a department over here that doesn't seem to be able to improve its work standards or whatever it might be, so you analyze the supervisory force and you decide that there are too many fellows there of the noncreative type.

This proper use of creative people —distributing them throughout your organization—can be a very effective tool in raising creativity.

Keep as many people as possible informed about needs and activities. This again is a matter of communication. We like to encourage people to know about the functions of other departments. Sometimes a fellow on the outside can see things that the person in the department can't.

These are just some of the principles that we find working very well in developing this creative atmosphere that we are looking for. We believe very much in formalized suggestion systems. We want everybody to understand how these suggestion systems work. In a suggestion system one of the things you've got to watch out for is that you don't get too many delays in considering a suggestion and giving individual answers. That can discourage people in making suggestions. Again, you have the problem of what to do when a suggestion is rejected. How do you handle it? By all means do it on a personal basis rather than writing a letter.

With highly creative people, of course, there are other things where you have people satisfied too completely. How do you handle them? Their physical location is very important. We find that a good idea man wants a room of his own. He perhaps wants a mechanic, a draftsman or two; he should have a drill press; he should

NORTHERN ORDNANCE INCORPORATED

Subsidiary of

NORTHERN PUMP COMPANY

Minneapolis 21, Minnesota

Guided Missile Launching Systems

Prime Supplier to

BUREAU OF NAVAL WEAPONS, DEPARTMENT OF THE NAVY

STOP COSTLY RE-DRAFTING OF ORGANIZATION CHARTS

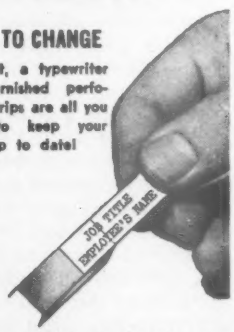
THE COFFIELD EVERLASTING

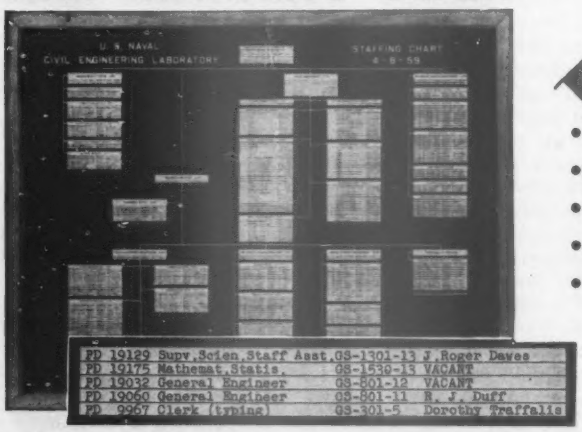
Interchangeable

ORGANIZATION AND MANNING CHART

EASY TO CHANGE

A typist, a typewriter and furnished perforated strips are all you need to keep your chart up to date!




U. S. NAVAL
CIVIL ENGINEERING LABORATORY
STAFFING CHART
4-8-59
PD 19129 Supv.Scien.Staff Asst. GS-1301-13 J.Roger Daves
PD 19175 Mathemat.Statis. GS-1530-13 VACANT
PD 19032 General Engineer GS-801-12 VACANT
PD 19060 General Engineer GS-801-11 R. J. Duff
PD 9967 Clerk (typing) GS-301-5 Dorothy Traffalis

- **Sizes to Fit Any Organization Structure**
- **Photographs for Sharp Prints**
- **Make Fast Spot Changes**
- **All Parts Are Movable and Re-usable**
- **In Government Service Everywhere**

ENLARGEMENT OF STRIPS SHOWN IN CHART. Each strip. Actual size ¼" x 6". This chart permits listing of all personnel by job classification, rating and name, if desired.

Write for free Illustrated Brochure AF-20 or Consult our GSA Federal Supply Service Contract GS-00S-34901 F.S.C. Group 71—Furniture—Part 9—Item 142-1.

MANAGEMENT CONTROL CHARTS CO.

1731 N. WELLS ST. • CHICAGO 14, ILL.

Creativity

(Continued from page 45)

have a lathe so he can try out his ideas without having to get a shop order for somebody else to approve.

Creative people like to be able to do things for themselves and try it out without having to expose their thoughts to a lot of people. They don't like to have a lot of paperwork to contend with, and routines of that sort. They like to feel they're important, so don't give them too poor an office. However, the kind of equipment and the kind of a place they work in aren't nearly so important as their ability to do things on their own and get things done without a lot of red tape.

We find that assigning work and projects to the creative person can be quite a problem. Some creative people tire quickly of working on any one idea so we have to know when to take it away from them and give it to someone else. After all, you don't always care whether he is the man who finishes it or not if he gets it started. When you see that he is losing interest in it, take it away from him.

These creative people like to have a lot of problems—several problems, so they can stimulate themselves by changing from one to the other and then coming back.

We should have a special classification for highly creative people. In industry, and maybe in the military too, there is a tendency that if you want to get ahead you have to be a supervisor.

The good creative fellow is often the worst supervisor. We've got to find some way to pay him without making him the head of a large department. We have set up some classifications such as Research Scientist and Research Specialist in which the man can be all by himself, or maybe he has a secretary and a draftsman. Yet, we'll pay him just as much as the head of a department.

This creativity work is just in its infancy, as I see it. Tremendous things remain to be done. It is going to be done by staying with it.

One of the biggest things that we will get out of this is what we are doing for the people themselves. As I said, people are born with much more creative talent than most of them use. God put this talent into people with the idea that they would use it.

We need the ideas because there are so many problems every day that need the help of idea people. So I can think of no finer way to enrich anyone's life than to stimulate him to a greater use of his creative talents. In so doing, it seems to me, we are going to benefit all mankind. ■

Procurement Trends

What's Behind Air Force Changes

Behind the recent, well-publicized Air Force reorganization, is the Air Force conclusion, in utilizing industry resources, that "you can't separate procurement from the project." Thus, Systems Command was given acquisition procurement responsibility, and the former AMC retained sustaining procurement job. Industry reaction, says Air Force, has been favorable so far.

What they like most: "We don't have so many things falling between the chairs anymore." Translation: In the past, it was far too easy for Air Force to issue an order, through AMC, to "cut back dollar expenditures by 10%," send another order at the same time, through ARDC, to speed up "Project X." Net effect: Industry would be getting simultaneous orders to "stop" and "go."

New organization will help correct that, also has implications on greater flexibility in using special projects approach to major weapon system development.

Attack Launched On Waste

More than six months ago, Washington began predicting that incoming Defense Secretary would make a "war on waste" one of his first priority programs. Public statements and a flurry of directives last month indicate the attack has started.

Agreeing with Congress' criticism of "horrendous examples of waste" in Defense, he countered with the claim that he could find equal waste in industry, concluded that pointing the finger at the Pentagon was "distortion." Thus, this will be two front war:

1—In military itself. (One service happily had already started before ordered—see "Mark Bradley's Money Tree" in this issue.)

2—Summoning a "command performance" of the National Security Industrial Association to a special cost reduction symposium, McNamara informed industry, bluntly, that Defense "will not tolerate inefficiency and practices which increase military buying costs." His statements have been echoed by just about every top official in the Pentagon since. Responsible firms reacted favorably, noted, however, that in many of the areas, potential savings aren't going to happen until the military gets its own house in order. NSIA has launched an "exhaustive study," will report to McNamara by the end of the year.

One likely result: more Defense use of some type of incentive contracting (which would give industry a chance at greater profits) and a shying away from the waste encouraging cost plus fixed fee method. General theme: "award efficiency and penalize waste."

OSD Answer To Brick Throwers

Rattling cages, as OSD has been doing busily for the past few months, is bound to result in heavy handed complaints. OSD has been remarkably relaxed in the face of all this fire, looks at the problem this way:

"If a new management team were put in charge of a $10-million-a-year industrial firm, few people would expect that company to run smoothly and make a profit overnight. Multiply that firm by 4,000 and you have the Defense operation. Obviously, some snarling must be expected."

Improved Procurement Techniques Needed: Bradley

AF Lt. Gen. Mark E. Bradley told the Michigan Aeronautical and Space Association last month that procurement techniques will be as important as specific R&D approaches to U.S. defense problems in this decade, and that industry and the armed services must scramble to keep abreast of procurement technology.

Gen. Bradley said military procurement planners will gear their efforts to fulfill eight specific needs: (1) Clearer statements of requirements—"when we're talking about a round ball we don't want contractors to think of a pear-shaped device. There is no room for misunderstanding resulting in grossly misstated costs."

(2) Types of contracts need closer study, with increased emphasis on fixed price agreements emphasizing earned gains and not windfalls. There will be a hard push for vigorous competition.

(3) Proposals will be reviewed with defense-dollar-time considerations in vigorous competition.

(4) Engineering changes will get a close scrutiny, especially alterations that cost more or tend to delay a project. "Gold plating and fancy frills should be dead. Lace on your drawers won't keep you a bit warmer at a BMEWS Site." (See "Money Tree" in this issue for a clearer idea of what Gen. Bradley means).

(5) Increased concern for time needed for development. Nobody wants to inhibit the scientific community, but there is a point of diminishing returns. "If a company wants to investigate at its own expense, that's fine but Uncle Sam has no intention of paying for the lyrical hum in a jet engine—we just want to hear it whine and feel it go."

(6) Reliable cost estimates are a must. "Where cost-plus-fixed-fee contracts are involved we have too many overruns. On a fixed-price basis companies take a risk, then profit according to their ability to manage a program."

(7) Drives for systems reliability will continue.

(8) Recognition of the right of industry to a fair, earned profit—but the stress is on earned profit. "We have records of 50 percent, 100 percent and as much as 1000 percent profit on items. These excessive and windfall profits must go."

Gen. Bradley said the Air Force doesn't need to be told what is wrong with ASPRS or AFPIs—unless criticism is accompanied by constructive suggestions. He said company executives should not worry too much about whether a cost is allowable but rather whether it is necessary.

You Get Things Done With Boardmaster Visual Control

☆ Gives Graphic Picture of Your Operations —Spotlighted by Color
☆ Facts at a glance — Saves Time, Saves Money, Prevents Errors
☆ Simple to operate — Type or Write on Cards, Snap in Grooves
☆ Ideal for Production, Traffic, Inventory, Scheduling, Sales, Etc.
☆ Made of Metal. Compact and Attractive. Over 500,000 in Use

Complete price $49.50 including cards

FREE 24-PAGE BOOKLET NO. AM-10 Without Obligation

Write for Your Copy Today
GRAPHIC SYSTEMS
Yanceyville, North Carolina

"Small Business Policy Threatens Security"

A top military procurement officer says President Kennedy's emphasis on giving small business a bigger share of the defense dollar has resulted in "anybody" being able of obtain specifications on many pieces of defense hardware.

"Anybody can tell us he is a small contractor and obtain the specifications," he told a reporter for the *Aviation Daily*. "The 'contractor' might be a Russian agent, for all we know. He's not investigated until he returns a bid."

The spokesman said this wasn't the case with secret hardware "because for that we go to an established, cleared contractor." But he said the information obtained in this manner nevertheless could be of great help to the Russians.

The officer made this comment after criticizing defense contractor advertising "which in some cases provides the Russians with pictures and specifications and what the product will do."

He said he agreed that sending of specifications to "anybody" was "just as bad" a practice as that charged against advertising.

Army To Expedite Manufacture of M14

The Army has acted to expedite manufacture of the new, lightweight M14 in order to re-equip the Active Army with the weapon as soon as possible.

Last month Brig. Gen. Elmer J. Gibson was granted extraordinary powers to exercise broad authority in the manufacture and supply of the new weapon.

The M14 rifle is being commercially produced by Harrington and Richardson, Worchester, Mass. and by Winchester-Western Div., Olin Mathieson, at New Haven, Conn.

The new rifle will replace four Army weapons: the M1 Garand rifle (now the basic Infantry arm), the M3 submachine gun, the Browning automatic rifle and the M2 carbine.

A third commercial production source is under consideration to further increase the rate at which the rifles will become available for service use.

General Gibson will operate from the office of Lt. Gen. J. H. Hinrichs.

DOD Defines 'Selling' By Retired Officers

The Pentagon for the first time has issued a comprehensive directive on military and civilian standards of conduct including a new, stiffer definition of "selling."

A spokesman for the team of DOD lawyers who wrote the directive said the guidelines stressed the need for as much clarity as possible within the confusing pattern of laws passed over the last century or more. The guidelines also emphasized that the tightest and strictest possible language was to be used.

The directive's key change defines "selling" to mean: "(1) signing a bid; proposal or contract; (2) negotiating a contract; or (3) settling disputes concerning performance of a contract; (4) any other liaison activity within a view toward the ultimate consummation of a sale even though the actual contract therefore is subsequently negotiated by another person. However, it is not the intent of this Directive to preclude a retired officer from accepting employment with private industry solely because his employer is a contractor with the Government."

Newsletter

Armed Forces Management Association
Washington 25, D.C. Phone: ME 8-1071

National President: Lt. Gen. R. C. Wilson, USAF Exec. Vice Pres.: RAdm. Thomas B. Neblett, USN, Ret.

Sears to Industry

After nearly three years service with the Association, Vice Admiral Harry E. Sears, USN, Retired, AFMA Executive Vice President, submitted his resignation in order to accept a position with industry. In his letter to the National President, Sears stated that he took the step with much reluctance, but that he had served at considerable personal sacrifice, and for a period far longer than initially anticipated. In accepting Admiral Sears' resignation, General Wilson wrote him, ". . . It is with the greatest regret that I accept your resignation as Executive Vice President of the Armed Forces Management Association. You have been the genius and prime mover of the organization at a personal cost which we all recognize and appreciate. It literally will be impossible to replace you. The gratitude of AFMA goes with you as does our heartfelt wishes for your continued success and happinesss."

Under Admiral Sears' guidance, the Armed Forces Management Association has risen from a small obscure group to a position of national prominence. It has been presided over by such senior officers and civilians in Defense as the Honorable George H. Roderick, former Assistant Secretary of the Army, Financial Management, and incumbent president, Lieutenant General Roscoe C. Wilson, Deputy Chief of Staff, Development, Air Force. Its Board of Directors have included such individuals of prominence as Vice Admiral Edward W. Clexton, former Navy Chief of Material, Lieut. General Arthur G. Trudeau, Chief of Development, Army, Thomas A. Callaghan, Jr., Eastern Representative of Ford Aeronutronic, Vice Admiral O. S. Colclough, Dean of Faculty, George Washington University, J. Robert Loftis, Administrative Officer, Office of the Secretary of Defense, and Major General Chester R. Allen, Quartermaster General, USMC. Its outstanding annual conferences have included nationally prominent figures from not only Defense, but industry, education, Congress and other governmental agencies as well. Its program and objectives repeatedly have been lauded by the civilian secretaries, the chiefs of staff, the Chief of Naval Operations and the Commandant of the Marine Corps. A number of new local chapters have been added to its roster at home and abroad. Many more are in the process of development. Its roll of corporate members includes many of our country's finest names in industry and has increased several hundredfold. Individual membership has more than doubled, and the effectiveness of the individual chapter programs has greatly increased. This has been brought about to a large degree by the personal interest and support shown in these programs by the senior officers in whose command areas the chapters lie, stimulated by personal letters from the Executive Vice President.

As he left his important position with the Association, Admiral Sears asked that the following message be conveyed to the membership: "My association with the AFMA and its fine members has been a truly rewarding experience, and one I shall always remember and treasure. I take this opportunity to express my great appreciation to all from lowest to highest for the fine support we have received for our program, which we feel is of such vital importance to our country's security. Management awareness and constant improvement of management methods and techniques are essential if we are to survive in the days ahead.

It has been a real privilege to be a part of this important contribution to our nation's defense. I wish the Association, its friends and supporters, every success and shall watch with keen interest AFMA's continual growth and service to our country."

Executive Vice President Appointed

The Board of Directors announces the appointment of Rear Admiral Thomas B. Neblett, USN, (Ret.), as Executive Vice President relieving Admiral Sears on 12 June 1961.

A graduate of the Naval Academy, Neblett's 34 years service have been devoted principally to a career in Naval Aviation. He has held three commands at sea, and was Commanding Officer, NAS, Naval Air Test Center, Patuxent River Naval Command, Md., just prior to retirement. Since 1957, his experience has included positions in the electronic industry and in the management and personnel field.

New Officers to be Named

A slate of new national officers and one half of the Board of Directors will soon be submitted to the membership for its consideration and approval. As in the past, the nominees will be men of stature and drawn from all the services and the OSD with a fairly even distribution between civilian and military, thereby insuring a maximum "mix" of management knowledge.

Fall Conference Notes

Plans for the next national conference to be held at the Sheraton-Blackstone Hotel in Chicago this fall are proceeding on schedule. Based on the lessons learned at our winter meeting, the conference has been reduced in total length (from three to two days—25, 26 October) but not in the quality of the production. Top flight speakers in a variety of management specialties, industry exhibits, reception and awards banquet—all are on the schedule as in the past. The only significant change is in the timing and tempo of the affair—to permit our busy participants to be away from their places of business a minimum of time. Plan to attend now. If an industry member, plan your exhibit while there is sufficient time to budget and coordinate the movement of your company's exhibit. Be thinking of an outstanding speaker to recommend on the program, thereby enhancing the prestige of the conference and your own corporation. This is a cooperative effort of mutual benefit. Submit your ideas, candidates and applications now to our Conference Chairman, John F. Burke, Fifth Army Headquarters, Chicago, Illinois.

AFMA Journal

The technical journal of the Armed Forces Management Association, covering all presentations made at the February National Conference, is now at the printers and will be mailed to the membership soon. This is an outstanding compendium of management thinking, and is a valuable reference work for personal and official libraries. A limited number of copies have been reserved for post and university library subscriptions. Librarians should submit orders early to insure receiving copies.

Put your finger on it FAST . . . with the Wassell TWIN CONTROLS

You can put your finger on trouble in seconds with the Wassell **TWINS**

Produc-Trol® will give you delivery dates, parts supply, project status.

Vu-Board will tell you if the machines are loaded to meet those dates.

There's no digging in files or calling for reports . . . The facts are right in front of you to foresee problems in time to solve them.

WASSELL
ORGANIZATION, INC.
Dept. A-8 • Westport, Connecticut • Est. 1935

Common Stock Investment Plan

For as little as $10 a month you can purchase shares in HAMILTON FUNDS. Hamilton is an investment fund holding common stocks of over 80 corporations, selected for income and growth possibilities.

Hamilton Funds

HAMILTON MANAGEMENT CORP.
Dept. H-4 Box 5061, Denver 17, Colo.

Please send prospectus-booklet without obligation.

Name_____

Address_____

City_____ State_____

Saving Money

(Continued from page 24)

Most missile people know that beryllium is a very desirable metal for use in inertial guidance systems.

Beryllium was tried for several components of the PERSHING stabilized platform, the ST-120. In the investigation of its potential in three particular components—the Gyro Inner Cylinder, the Cover, and the Carrier Ring—beryllium proved adaptable and performed exceptionally well. But beryllium is scarce and costly.

Thinking value analysis, ABMA engineers asked whether this metal was essential in these components. The following facts were noted: the components had already been fabricated from other metals—monel in the Cylinder and Cover, and aluminum for the Carrier Ring.

There were basically only two questions. Beryllium is a better metal for the job, but does it contribute enough additional accuracy, reliability, and performance of the ST-120 to offset the additional costs? Secondly, is there another metal that would serve.

The value-conscious engineers found the answers. The Inner Cylinder and Cover did require the beryllium. The Carrier Ring, however, did not. Result: an automatic saving of $3.4 million, plus uncalculated savings for the beryllium facilities that would not be required.

The second example of positive results from applying value analysis early in the R&D phase occurred in another ABMA missile systems.

The contractor, in this case, looked at his product to ascertain whether he had some so-called peculiar parts that could be standard. He learned that, in the system, 384 parts, labeled peculiar to that particular system, had counterparts or equivalent parts that were already listed in Military Standards or in commercial catalogues.

ABMA said: Eliminate the more expensive peculiar parts and substitute standard parts in the system. Use a conservative estimate of $10,000 cost of adding each of the originally proposed peculiar parts to the Military Supply system. ABMA found that the saving to the Government amounted to $3,840,000.

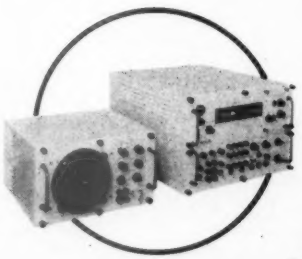
To these two examples, ABMA engineers and contractors are already adding hundreds more.

Scotty McMissile is on the job at ABMA. He peeks out from bulletin boards, from presentations artwork, and from publications pages to remind every single member of the organization to "take that second look first and give our country the most missile for its missile dollar." ■

Advertisers' Index

Acme Visible Records, Inc.	35
Allison Div., General Motors Corp.	30
American Bosch Arma Corp., Arma Div.	36
American Machine & Foundry Co., Government Products Group	3
Caterpillar Tractor Co., Defense Products Div.	17
Collins Radio Co.	51
Continental Motors Corp.	43
Denison Engineering Div., American Brake Shoe Co.	13
Government Products Group, American Machine & Foundry Co.	3
Graphic Systems	48
Hamilton Management Corp., The	50
Hoffman Electronics Corp., Military Products Div.	6
Lockheed Aircraft Corp., Georgia Div.	8
Management Control Charts Co.	46
Martin Co., The	4
McDonnell Aircraft Corp.	52
Northern Ordnance Inc.	46
Pan American World Airways	26, 27
Philco Corp., Government & Industrial Group	10
Teletype Corp.	41
Wassell Organization, Inc.	50
Westinghouse Electric Corp., Defense Products	2

COLLINS LORAN C RECEIVING SYSTEM...*FOR FINITE* POSITION FIXING



Collins Loran C Receiving Systems, now in production, provide continuous position fixing information for **land, sea and air navigation.** Two time difference measurements — one between each Loran C slave station signal and the master station signal — are displayed on odometer-like counters in **increments of 0.02 microseconds.**

Collins systems are ideal for precision navigation, monitoring, underwater cable laying and repair, antisubmarine warfare, mapping and surveying, and test range instrumentation. Recorders and computers can be accommodated.

The system works automatically and is simple to operate. It consists of a receiver and an indicator, both transistorized for high reliability and low power consumption. Modular construction and plug-in card circuitry allow quick access and easy maintenance.

COLLINS

Collins Loran C Receiving System, military nomenclature AN/SPN-30, was developed for the U. S. Coast Guard and is another example of Collins advanced R&D which covers the electronics spectrum. For details on Collins Loran C or R&D, contact Collins Radio Company, Texas Division Sales.

COLLINS RADIO COMPANY • TEXAS DIVISION SALES • P. O. BOX 1891 • DALLAS 21, TEXAS

CH/AIR UNIV QUARTERLY
HQ MAXWELL AFB /REVIEW
MONTGOMERY ALA

C-AFM 3-17-0 13-1

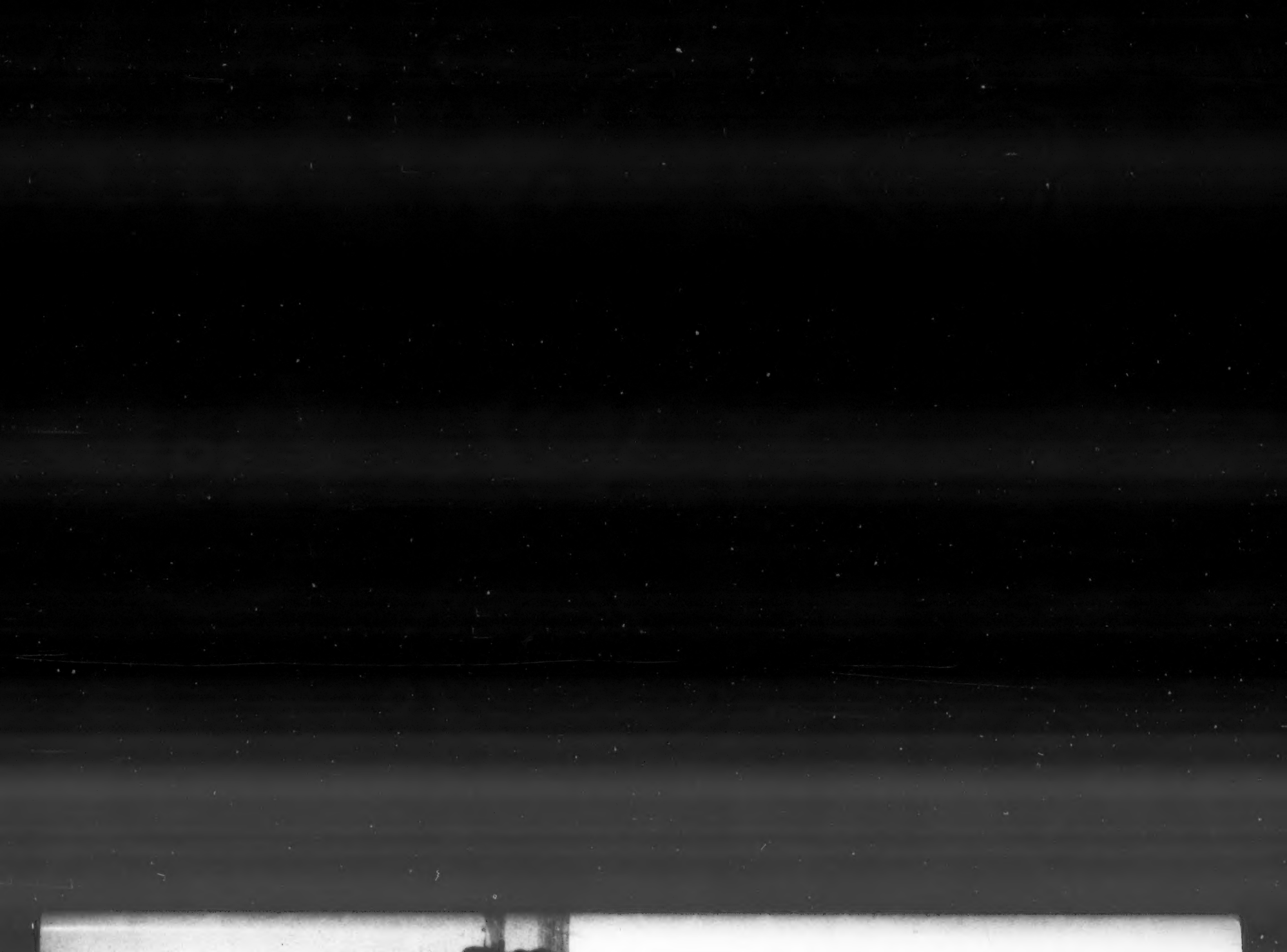
COAST-TO-COAST in 170 MINUTES

Crossing the continent at the rate of a mile every four seconds, Navy Pilot Lt. R. F. Gordon and Radar Intercept Officer Lt. jg D. R. Young flew a McDonnell Phantom II from Los Angeles to New York in two hours, 48 minutes, 44 seconds on May 24, 1961 to win the Bendix Trophy Race and establish a new record for the distance.

The record was set minutes earlier by Lt. Commander L. S. Lamoreaux and Lt. T. J. Johnson in another Phantom II. Their record was two hours, 58 minutes, 19 seconds.

The lead crew, Commander J. S. Lake and Lt. jg E. Cowart flashed over New York in their Phantom II even before the other two to break a three-year old record established by an Air Force RF-101 Voodoo, also built by McDonnell. In all, the last *seven* west-to-east transcontinental speed records were set by pilots flying aircraft built by McDonnell. The Navy's carrier-based all-weather Phantom II also holds the world's 100 kilometer and 500 kilometer closed course records. Setting these distance and maneuvering records requires a very high straight-line speed capability. Security permits only the statement that maximum dash speed for the Phantom II is "in excess of 1500 mph."

MCDONNELL

Phantom II and F-101 Fighter and Attack Aircraft • Project Mercury and Aeroballistic Spacecraft • Talos Airframes and Propulsion Systems • Quail Decoy Missiles • Rotorcraft • Electronic Systems • Automation

MCDONNELL AIRCRAFT • ST. LOUIS